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THE NEXT WAR
a series edited by
CAPTAIN LIDDELL HART

Air Power

in the next war

by
J. M. SPAIGHT, C.B., C.B.E.

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GEOFFREY BLES
TWO MANCHESTER SQUARE, LONDON, W.1

AIR POWER IN THE NEXT WAR

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Edited by Captain Liddell Hart

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EDITOR'S PREFACE

MODERN war has too wide an effect for its practice to be treated as a "mystery." Statesmen may direct it ; generals, admirals and air marshals may manage its operations—but every citizen, man or woman, is perforce a shareholder. The more they know about the way it is conducted the better for their security. The aim of this series is primarily to enlighten the intelligent public as to the probabilities of a future war in its various spheres, if it is hoped that the military reader also may find some stimulus to thought, about his problems.

Although twenty years have passed since the last great war ended, it left so deep an imprint that we are apt to overlook the fact that few of the men now under arms, and fewer still of those who might be called on, have any personal acquaintance with war. The natural consequences are to be seen in any of the exercises carried out by the Regular and the Territorial Army during the annual training season. On these battlefields without bullets or shells, many things are done which would be impossible under actual fire—and without their impossibility even being perceived. The unreality is often increased because the situations on which exercises are based have themselves an air of improbability. This is due largely to a tendency, natural in those who are practising any particular technique, to think of war in bits instead of as a whole. They find it difficult to visualise the effect

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on their bit that others may produce, with the result that the picture is distorted. The best corrective to the particularist tendency is to view each aspect of war against a wider background.

This series of volumes, in which different aspects are treated as far as possible in relation to each other, may help to form such a background.

Air Power in the Next War is a subject which has received abundant discussion ever since the last war, but to the increasing confusion of the general public, and even of those who are responsible for the national defences. No question of such vital significance has suffered worse from the effects of controversy, owing to the contradiction between the views expressed. This is the more unfortunate since no feature of modern war so closely affects the people as a whole; the growth of air power is threatening to demolish the laws and customs of war which have been gradually established by mutual consent towards limiting its ravages. For these reasons there is special value in obtaining the view of a student of air warfare who is at the same time an authority on international law. Mr. J. M. Spaight fulfils the double qualification. Prior to his retirement from the Civil Service in 1937 he had occupied several important posts in the Air Ministry, while his writings on the laws of warfare as affected by modern developments have gained him a reputation as wide as it is high. It would be impossible to find anyone more fitted to provide a balanced and foreseeing judgment on the whole issue.

ACKNOWLEDGMENT

I AM indebted to Mr. H. A. Jones, M.C., and Group Captain J. C. Slessor, D.S.O., M.C., for kindly reading Chapters II and VIII respectively, in proof, and for a number of very helpful suggestions. For the opinions which I express in those (and the other) chapters, however, the responsibility is mine alone.

J.M.S.

July, 1938.

CHAPTER I

INTRODUCTION

It is necessary to begin by defining the terms employed.

What is meant by " air power " ?

What kind of war is envisaged when we speak of " the next war " ?

The term " air power " is often used loosely. It is used at times as if it referred to civil air transport or perhaps to civil aviation in general. When, for instance, Sir C. D. Burney asks,¹ " How soon is the driving power of air power going to make itself felt ? " he appears to be using the term in one or other of these senses. It is used, again, as if it meant some kind of control of the surface in war. Thus Admiral Sir Herbert Richmond states² that " air power is a misnomer, aircraft being themselves instruments of sea power ; weapons employed at sea for the purpose of disputing the control of the sea, which is the object of sea power." It is certainly a misnomer if used in that sense ; but then that is not the true sense of the term.

¹ Air power is a reality as certainly as sea power

¹ *The World, the Air and the Future*, 1929, p. 160.

² *Sea Power in the Modern World*, 1934, p. 117.

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is. If the existence of the one is denied, that of the other cannot escape challenge. The logical case for the recognition of each is the same. The difference is that sea power has a pedigree behind it, while air power is a parvenu. But the parvenu exists no less than the inheritor of tradition.

Sea power, Sir Arthur Keith has taught us, became a potent factor in the basin of the Mediterranean some five or six thousand years ago. The sea has been the highway of invasion since the dawn of history. Air power has emerged only in our own generation. It has made its appearance in a world more sophisticated, more self-conscious, more internationalised than that in which, from the earliest times, sea power has helped to make history. It can never have the same influence upon the peopling of the world, the distribution of populations, the shifting and cross-fertilising of races. But it may yet shape the destiny of nations, nevertheless.

Sea power, in A. T. Mahan's analysis, is the product of six elements. They are: the geographical position of a country, its physical conformation (with its natural products and climate), the extent of its population, the number of its population, the character of its people, and the character of its government. Whether corresponding elements will prove to be required for the founding of a nation's air power the future only can show. What is certain is that as a nation's sea power, whatever the ultimate basis, manifests

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itself in the possession of a national navy, strong enough to use the sea as the setting for all those measures of violence and restraint, military and economic, which are permitted by the practice of maritime war : so a nation's air power manifests itself in its possession of a force strong enough to meet in the air the force of any other nation on not too unequal terms, to intervene effectively in war in the air, to use the pathways of the air for the purposes of offence and defence.

Air power does not mean command of the air ; nor, for that matter, does sea power amount to command of the sea. In neither element can there be command in the sense of absolute mastery. "The normal condition in war is for the command [of the sea] to be in dispute," says Sir Julian Corbett.¹ We used to speak, indeed, of "command of the sea," but we really meant something a little different. "In the good old days before the war we used to talk of the command of the seas. To-day we have dropped that term and speak of control of sea communications—and air superiority, not command of the air. The reason is to be found in the same quality, the capacity for evasion, at sea of the submarine, in the air of the aeroplane. Once warfare gets into the third dimension, whether above or below the surface, the cubic area of the battlefields is so immense that absolute command is hardly ever practicable."²

¹ *Some Principles of Maritime Strategy*, 1918, p. 188.

² J. C. Slessor, *Air Power and Armies*, 1936, p. 5.

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Local and temporary superiority or control is all that can be won in the air in a war of contestants who have air power at their command. There can be no monopolistic use of the domain of the air by a State whose enemy possesses a formidable air force. Air power is indeed simply the ability to come and go in the air on war-like errands ; it does not imply the exclusive use of the air space. That is obvious, for there can be no impassable barriers in the clouds.

When one speaks of air power, one implies, where great nations are concerned, a certain but undefinable standard of first line strength and, behind that, both the immediate and stored reserves which can be used to replace losses, and—which is as important—the manufacturing capacity and resources which can make good the gaps in the reserves and even increase the output in war. Reserves of personnel and adequate means for the training of human replacements are no less essential. Without such a solid background there can be no reality in air power. It becomes merely a façade which must crumble in war ; as the sea power did which France sought to create for the War of the League of Augsburg at the end of the seventeenth century.

Referring to that time, Mahan says¹ : “ It is equally the nature of a merely military navy like that of France to be strongest at the beginning of hostilities ; whereas that of the allied sea powers

¹ *The Influence of Sea Power upon History*, p. 180.

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(England and Holland) grew daily stronger, drawing upon the vast resources of their merchant shipping and their wealth."

Mr. Chamberlain, the Prime Minister, emphasised the broad-based structure of air power in his speech in the House of Commons on 7th March, 1938. He was referring to Mr. Baldwin's pledge of 8th March, 1934, that "in air strength and air power" this country would no longer be put "in a position inferior to any country within striking distance of our shores."

Something more than first line strength, which was often taken as the yard-stick, was here in question, said Mr. Chamberlain. First line strength was only one of a number of factors which went to make up air power and air strength, and by itself might be "a delusion and a snare."

"Apart from the difficulty," he said, "of deciding what machines and what squadrons you should include in the first line, there are also to be considered the reserves of aircraft, the reserves of bombs and equipment, the war potential which could be used in aircraft or bombs, the access to raw materials which will be required in their manufacture, and also I do not think we can leave out the value of anti-aircraft defence, including any special devices which may have been developed by one country or another. Then, of course, we must take account of personnel and the moral of the force. I believe Napoleon once said that in war the moral was to the physical as three to one. We have to take into account the training of our pilots and their racial temperament and characteristics. But, of course, we must also include the quality of the aircraft as measured by their speed, their range and the nature of their equipment."

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Political opponents or carping critics might see in Mr. Chamberlain's analysis of air power little more than an elaborate excuse for our having allowed Germany to overtake us in first line strength ; but there can be no question but that the various elements which he enumerated do in fact enter into the composition of air power, properly conceived. It is evident, too, that, so conceived, air power can be established and maintained only by a great and wealthy nation. Venice held the gorgeous East in fee by the might of her sea power alone. No small city State could ever hope to win and hold an empire by air power.

The characteristics of air power in action are mobility, penetrativeness, evasiveness, swiftness and suddenness in stroke and, ~~countersroke~~. The element in which it operates is more universal and all-pervading than the sea. It was only in Shakespeare's fancy, we know, that Bohemia had a tidewater frontier on which foreign galleons might have landed their invading hosts. To-day, as Czechoslovakia, she has frontiers which, being lapped by the tides of the air, could become the path of invasion of a kind which even Shakespeare's imagination never pictured. Air power has played curious pranks with many of the axioms of geography and defence. It has made Britain a continental power. "The Watch on the Rhine" is the song which we are singing subconsciously to-day. If the Rhine is our new frontier it is one which others must watch lest we cross it too.

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There should be a stabilising influence in Europe as a result of that strange new fact.

The definition of air power, it will be seen, defies reduction to the confines of a sentence or even a few paragraphs, and even an expanded definition, or more correctly, explanation, must always be related, as the writer shows in Chapter VIII of this book, to the character of the State which uses air power and to the nature and stage of the war in which it is used. The second term in the title of this book, "the next war," is likewise one for which no succinct formula of explanation can readily be found.

The war in question, it may at once be assumed, is a war in which at least one of the belligerents has air power at his disposal; that, indeed, follows from the very nature of the enquiry. The other belligerent, if a Great Power, must be assumed also to be strongly armed in the air. Any other hypothesis would be lacking in realism in the world as it is to-day. The second belligerent may not, however, be a Great Power and his air strength may be negligible in comparison with that of the first. Clearly the problem is a very different one in the one instance than in the other.

The belligerents, again, may or may not have a common land frontier. If they have, one would expect the tasks to which the air arm would be assigned to be ancillary to those of the armies, or at least less independent and primary than where

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non-limitrophe States are at grips. Correspondingly, where the States are separated by wide stretches of sea, the fleets would naturally be expected to play the principal part in a war and the rôle of air power would be subordinate to that of sea power. If, on the other hand, there were but a narrow strip of water between the two belligerent countries, the fact that their territories lay within the effective radius of action of aircraft operating from home bases would probably lead to the air arm taking a more important, possibly a predominant, part in the struggle.

It is conceivable, indeed, that the air may be a dominant arm in defence against invasion, whether broad or narrow seas separate the combatants. Mr. W. M. Hughes, the former Premier of the Commonwealth, describes¹ the aeroplane as "a gift from the gods" for Australia, for, he says, "it places in our hands and within our resources an agency so exactly suited to our circumstances and our needs that we might well regard it as designed for our special benefit and protection." A strong Australian air force, he considers, would be able "not only to overwhelm any enemy aircraft, to destroy all transports, plane-carriers and supply-ships accompanying the fleet, but also to disable, if not destroy, his armed vessels."

The claim thus made by Mr. Hughes for the air arm may be overstated, but it would be

¹ *Australia and War To-day*, 1935.

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endorsed in part at least by expert opinion in this country. In a lecture at the Imperial College of Science on 9th December, 1926, Air Vice-Marshal Brooke-Popham said that study of the question at the Staff College had led to the conclusion that a landing could not be made on an enemy coast in the face of opposition by enemy aircraft. Britannia's bulwarks have suffered a second sea change, it seems, since Nelson's day.

The fact that one or each of the belligerents had allies on his side might likewise affect the use which would be made of the air arm by one or the other of the powers at war. It is conceivable, for instance, that if Great Britain were engaged in a struggle with a European power the work of our air squadrons might be dictated to some extent by the particular needs and circumstances of the ally or allies whom we should almost certainly have on our side, and might differ from that which they would perform if we were involved in a single-handed fight.

Wars between States of approximately equal cultural development are not, of course, the only wars in which air power may challenge the pride of place of the older arms. It will have an influence, probably a profound influence, upon wars with uncivilised tribes or semi-civilised peoples. Already, indeed, it has won its spurs in Iraq, in Aden and on the North-West Frontier of India. A valuable summary of its achievements in these various theatres is to be found in Liddell

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Hart's *When Britain Goes to War*.¹ To the instances there given the present writer would add another which seems to him to be worthy of record.

In January and February, 1920, in the space of three short weeks, a dozen D.H.9's of the Royal Air Force destroyed the power of the notorious and evasive "Mad Mullah," scattered his followers to the winds of heaven and sent him flying, a discredited refugee, into Italian Somaliland. "The problem which has exercised the minds of the Protectorate Government for seventeen years," said the official *communiqué*, "and caused an expenditure of millions of money, has, it is hoped, been dealt with at a minimum of cost and with practically no casualties." The hope, it may be added, was fulfilled; the power of the Mad Mullah was indeed broken once and for all.

Air power, beyond all reasonable doubt, could have saved Gordon from his fate in Khartoum. It may change the course of history again on any of the ragged edges of empire. The white man's burden will be borne in increasing degree, and for good rather than for ill, in the cockpit or fuselage of an Air Force machine.

It would be a tedious and rather barren task to try to evaluate the place of air power in each of the various kinds of war in which it may be used. A good deal of what is said in this book is applicable, indeed, to any and every kind of

¹ *When Britain Goes to War*, 1935, pp. 125-148.

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war. Where, however, the particular questions for consideration are of such a nature that, to be comprehensive, the discussion should distinguish between different categories of wars and examine each one separately, the writer has thought it advisable to ignore wars other than that which, consciously or subconsciously, we all have in mind when we speak of "the next war." This, beyond question, is a war between our own country and a Great Power in Europe, within bombing range; in fact, another war like that of 1914-18, but not necessarily with the same, or perhaps any, allies on each side.

No reference is made in this book to the possible use of air power by an international force, or by an extemporised force of that kind which might be assembled *ad hoc* if collective action were taken under the provision in Article 16 of the Covenant of the League of Nations relating to air (as well as military and naval) sanctions. Perhaps the day will come when air power will be used by forces of this kind, but it does not seem to be approaching with any undue rapidity at present. Meanwhile, sufficient unto the day are the wars thereof.

CHAPTER II

AIR POWER IN THE GREAT WAR

WE are often warned, sometimes to our annoyance, that we must not assume that the next war is going to be like the last or to start where it left off, for no next war is ever so accommodating or unoriginal as to be or do either of these things. That may be quite true, but there may nevertheless be some advantage in refreshing one's memory about certain events of the previous war, if only for the purpose of marking any points at which differences in conditions are likely to be found in the next as a result of changes in the technique of offence or defence.

Military aviation, if not a war baby, was at least not fully grown in 1914-18. It had not found itself by the close. It was still groping for its bearings. That was hardly surprising. Blériot's historic cross-Channel flight took place only five years before the war began, and it usually requires more than five years for a technico-military idea to germinate. Our fleet was still a sailing one at the time of the Crimean War although the Atlantic had been crossed by a steamship thirty years earlier. The serviceable

military aircraft in existence in 1914 numbered, for the whole world, only a few hundreds; the flying personnel could have been housed in a barrack of moderate size.

Military aviation was conceived of at that time mainly as a service of information. Aeroplanes were scouts, whose function it was to find out what was on the other side of the hill. They carried no armament. The observer in a two-seater sometimes armed himself with a carbine or a revolver; the earliest pilots had no means of defence at all. The machine-gun, in single-seater tractors, was used with a deflector on the air-screw, or was mounted on the top plane outside the radius of the air-screw. Then the Germans installed synchronising gear in their small monoplane fighter, the Fokker E.I., and the Allies, who had previously relied for frontal fire upon "pusher" aeroplanes such as the D.H.2., in which the engine and air-screw were behind the pilot, devised various types of synchronising gears soon after. Even at the end of the war the best of our fighter aeroplanes, such as the S.E.5A and the Snipe, the speed of which was not more than 130 miles per hour, were in comparison with the modern low-wing monoplane fighters slow and inadequately armed. Our fastest fighter of 1918, the Martinsyde F.4., which was in production, not yet in service, at the Armistice, had a speed of only 142½ miles an hour at 15,000 feet—a speed which would

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probably drive the pilot of a monoplane fighter of to-day to profanity or a request to be allowed to get out and walk.

Bomb-sights and bomb-racks were equally lacking at the beginning of the war. Before the Armistice, the specialised heavy bomber had appeared, in the shape of our Handley Pages and the German Gothas and Giants. The largest bombers had not been brought into service in November, 1918. On the eighth of that month the Handley Page bomber with four 375 h.p. Rolls-Royce engines was standing ready to start for Berlin, but its departure was suspended in view of the negotiations for the Armistice. Our other big night bomber, the Vickers Vimy, was still in the workshops when the war came to a close.

The biggest British bomber which was actually used in the war, the Handley Page O.400, with two 275 h.p. Rolls-Royce engines, had a bomb-carrying capacity of less than 2,000 lb. The largest type of bomb actually dropped by our Air Force in Germany was one of 1,650 lb. A few of these bombs were dropped by our aircraft in 1918. The effect of one which was dropped by a Handley Page bomber of No. 100 Squadron in Kaiserslautern on the night of 21st October, 1918, can be seen from the photographs in Major C. Gordon Burge's book, *Annals of 100 Squadron*. The German Giant bombers (*Riesenflugzeuge*), with three to five engines

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which were first used at the end of 1917, could each carry nearly a ton of bombs, but they proved to be difficult to construct, maintain and handle, and did not fulfil expectations. The twin-engined Gothas, which were not so large, could carry about half a ton of bombs. A modern heavy bomber could carry a load of bombs not far short of that which a whole squadron of Gothas carried in 1918.

The speed and range of the bomber have also been increased almost out of all knowing. The increase in hitting power and in performance as a whole is, of course, a very important new development to be taken into account in applying any lessons of the last to the next war.

In the Great War the work carried out by the air forces on both sides was mainly ancillary to that of the armies and, to a less degree, of the fleets. Such independent action as there was, was spasmodic, secondary, intermittent, a kind of spare-time employment. The Germans indeed formed a special squadron—No. 3 Bombing Squadron—in March, 1917, for the purpose of carrying out raids on Great Britain. It had four flights of six twin-engined Gotha bombers at first, later increased to six flights. We on our side formed in October, 1917, the special unit known as the 41st Wing, consisting of one squadron of F.E.2B night bombers, one of D.H.4 day bombers and one of Handley Page night bombers, to raid Germany from an aerodrome at Ochey near Nancy. The

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Wing was expanded into a Brigade—No. VIII—in February, 1918, two D.H.9. squadrons being added to it. Then, in June, 1918, the Independent Air Force was formed and four fresh bombing squadrons and a fighter squadron were incorporated in it. It dropped 550 tons of bombs in the five months of its existence, 220 of them on enemy aerodromes.

It is safe to say that a similar weight of bombs could be dropped to-day by the bombing squadrons of any first-class Power within the first week of war. Italian aircraft dropped 396 tons of bombs during the six days in February, 1936, for which the battle of Enderta continued, and the bomb-loading capacity of aircraft has been increased since then. Actually, more than 550 tons might have been dropped by the Independent Air Force if the limitations imposed by inadequacy of technical equipment and of training had not restricted its activities. The operations, Mr. H. A. Jones points out,¹ had to be conducted with makeshift bombers of limited range, the employment of which even within the limits of that range was dictated largely by weather and general conditions. "Nor," he adds, "could bombing squadron be sent into action immediately on arrival at the front from England. It was desirable that three or four weeks should be allotted for final training, and when the squadron was judged to be ready for flying.

¹ *The War in the Air*, vol. I, p. 138.¹

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service, it was still necessary, as a beginning, to restrict the attacks to targets at short or medium ranges."

The danger of employing on long-distance raids pilots whose training for such work had not been sufficiently thorough was shown by the tragic results of a particular raid on 31st July, 1918. No. 99 Squadron then set out to raid Mainz, but, on account of the weather conditions, later made for Saarbrücken instead. Three of the twelve machines turned back with engine trouble, seven were shot down during the outward and homeward flights, and only two recrossed the lines after the raid. "The squadron records," says Mr. Jones,¹ "show that most of the pilots who had recently joined the squadron from England had arrived with little experience of flying in formation, and the success of day raiding depended on the efficacy with which formation could be kept."

The German aeroplane raids upon Great Britain were also limited by the lack of sufficient bombing machines. The manner in which Germany was handicapped in this respect is the subject of recurrent complaint in the books of Von Hoepfner² and Neumann.³ Up to May, 1918, the greatest number of bombers which set out on any raid against Britain was 27; on

¹ *Ibid*, p. 141.

² *Deutschlands Krieg in der Luft*, 1920.

³ *Die deutschen Luftstreitkräfte im Weltkriege*, 1920.

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the final raid of 19th-20th May, 1918, 43 bombers started. "The whole British defensive organisation was maintained to meet the threat from this comparatively small striking force and the more remote threat of occasional airship raids."¹

The total weight of bombs dropped in this country during the war was only 270 tons, of which 196 were dropped by airships and 74 by aeroplanes. Small as the effort was, its results were important. "On military grounds," says Mr. Jones,² "the air attacks on England were overwhelmingly justified by the results." Those results cannot be measured by the number of people killed (557 by airship and 857 by aeroplane raids) or injured (1,358 and 2,058) or by the material damage done (£1,527,585 and £1,434,526). The indirect and incidental consequences were more important. To meet the threat of raids we maintained in this country forces which comprised in June, 1918, 469 anti-aircraft guns, 622 searchlights, various kinds of other material, 6,136 officers and men, in the ground defences, as well as, for active air defence, 660 officers and 3,639 men, with 376 aeroplanes, these being in the VI Brigade, to which the Balloon Wing with its 82 officers and 2,573 men was additional.

Not only was a substantial part of our available air and anti-aircraft establishments thus locked

¹ H. A. Jones, *The War in the Air*, V, p. 154.

² *Ibid*, p. 153.

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up in this country, but, on occasion, there was an actual diversion of our force in the field to the purposes of home defence. Instances were to be seen in the withdrawal from France of two of our best fighter squadrons to defend London at a critical moment of the fighting in France in 1917, and in the decision that supplies of Sopwith Camels, which were badly needed at the front to cope with the new German Albatros fighters, should be used to re-equip home defence squadrons. "So," says Group Captain J. C. Slessor,¹ "the activities of these few German bombers, miles away from the scene of the battle on the ground, had an effect upon the air situation over the decisive front which, though incalculable, must have been enormous; at least they prevented us from obtaining a degree of air superiority that in all probability would have materially shortened the war."

The effect of the raids on the output of munitions was far from negligible. "Official figures," says Mr. Jones,² "for some raids show that when an attack was in progress, seventy-five per cent. of munition workers in areas warned of the attack ceased work, and that the output continued to be restricted for about twenty-four hours after the raid had ceased."

A memorandum which Mr. Churchill, then Minister of Munitions, prepared for the War

¹ *Air Power and Armies*, 1936, p. 24.

² *The War in the Air*, V, pp. 154-5.

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Cabinet at the time showed the effect upon the output of munitions of the night raid of 24th-25th September, 1917, upon Woolwich Arsenal. The normal output in a night shift was 850,000 rounds of .303 ammunition; it fell to 140,000 rounds on that night, as a result of the absence of nearly three-fourths of the workers. The drop in production of other kinds of ammunition was also very notable.

The effect of the raids conducted by the Independent Air Force upon German industrial centres was no less strikingly manifested in the reduction of war production. They, too, led to the diversion of fighting squadrons from the front for the protection of towns in the Saar and elsewhere. An American officer, Captain E. V. Rickenbacker, who commanded No. 94 Pursuit Squadron, records in his book,¹ that the work of his own and the other squadrons on the western front was appreciably assisted by the raids of the Independent Air Force, which drew important air and anti-aircraft forces out of the German battle-zone for defence duties in Germany.

The record would have been even more impressive if the war had not ended when it did. If it had continued throughout the year 1919 there is a strong probability that the Allies would have overwhelmed Germany in the air. In October, 1919, Great Britain, France and the United States were producing over 8,000 aero-

¹ *Fighting the Flying Circus*, 1919, p. 314.

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planes and over 14,000 engines a month, as compared with Germany's production of about 2,000 of each. The United States production of engines was actually 6,000 a month, and it had not yet got into its stride.

In April, 1917, Mr. Douglas Sladen prophesied in a letter to the Press that "a locust flight of aircraft from America will reduce Germany to earth and rock." Actually, the American contribution to the Allies' air effort was a disappointment, because of production difficulties and inexperience in administration; hardly a single American machine came into action and the American pilots for the most part flew French and British machines. But the errors had been corrected by the autumn of 1918, and the United States, with its enormous resources of manufacturing power and man power, could easily have surpassed all the other countries in the output of aircraft if the war had continued for another year. If it had done so, we should have obtained a clearer idea of the advantage of supremacy in the air.

As it was, the material destruction caused by the raids was, on the whole, not spectacular, but there were one or two exceptions. The most notable, in air raids into Germany, was that caused by the bombing of the goods station at Thionville on 16th July, 1918, by Nos. 55 and 99 Squadrons, equipped with D.H.4's and D.H.9's respectively. A munition train happened to be

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standing in the centre of the station ; it was hit by a bomb and the explosion of the shells loaded on the train set fire to a goods shed and to trucks near it, as well as other buildings. The whole station was practically gutted and immense damage done. In the German raids upon this country the greatest damage caused on any single occasion was done by a 1,000 kilogramme bomb which was dropped by a Giant bomber on 7th March, 1918, in Warrington Crescent, Paddington. Four houses were completely demolished, ten were severely and about four hundred slightly damaged. A photograph of the devastation caused may be seen in J. Morris's *German Air Raids on Great Britain*.¹

We hear much in these days of the devastation which is likely to be caused by the dropping of immense numbers of small incendiary bombs in the next war. In the Great War incendiaries (Brandbomben) were dropped in many of the raids upon this country, but the results on the whole were not serious. They were bombs of 4·5 kilogrammes in weight and, according to Major Freiherr von Bulow,² they were a complete failure. Large numbers of them were dropped in night raids upon England of 31st October and 6th December, 1917, he says, and the result was very disappointing. In the raid of 6th December, upon London, "fires were started

¹ p. 256.

² *Die Luftwacht*, July, 1927.

here and there," says Mr. Morris,¹ "but without any serious consequences."

On the other hand, it must be remembered that, like the bomb-sights and other equipment then in use, the incendiaries of twenty years ago were of poor quality and far from satisfactory, technically considered. An improved incendiary was devised by the Germans in the spring of 1918—the Elektron bomb of one kilogramme weight, which was designed to create a fire that could not be quenched by water. It was proposed in August, 1918, to use this bomb against London and Paris, but the proposal was vetoed—on humanitarian grounds, Freiherr von Bulow states; no doubt the possibility of reprisals was also a cogent reason for caution. The whole stock of the bombs was destroyed, the same writer states, and their composition is not exactly known. According to a French writer, Lt.-Col. Vauthier,² the bomb was made of almost pure magnesium and burned at a temperature of between 2,000° and 3,000°. The incendiaries used in the next war will probably be much superior to anything used in the late war, but whether they will be more effective may be doubted; reference to this question is made again in Chapter VIII.

Among the measures that are now being taken for the protection of London is, it is well known, the establishment of a balloon barrage. The

¹ *German Air Raids on Great Britain*, p. 249.

² *Le Danger Aérien et l'Avenir de la Paix*, 1930, p. 22.

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Great War witnessed similar experiments in defence. In Britain, France, Germany and Italy, balloon defences of various kinds were tried. Our own system was one of "aprons," each consisting of three Cacaquot balloons anchored at intervals, with a horizontal wire between the balloons and vertical steel wires suspended from the horizontal one. The balloons could be elevated to a height of about 10,000 feet. Their winches were fixed, not mobile, as are those of the new barrage, and the cables were not lethal, as the new ones are understood to be. They were effective in so far as they forced the German raiders, who feared to foul the wires, to keep above them. One German Giant did foul an apron near Chingford in Essex, but was not seriously damaged. Probably the effect on the nerves of the raiding pilots, who could not always know how high the barrage had become, was the most important contribution which it made to the defence of London.

One of our own aircraft was brought down by colliding with a balloon barrage at Thionville in 1918, and two Austrian pilots were killed in the same way at Venice. A French machine was also brought down by a German balloon barrage.

Air operations against merchant shipping may be an important feature of any major war in the future. In the last war, Germany staked all on her submarine campaign and used her air arm

but little in the war on commerce. In the early part of 1915, however, it seemed that she was intending to resort to "frightfulness" from above as well as from below the surface; and again in 1917 her seaplanes made a number of attacks on merchant ships. In March and April, 1915, attempts were made to bomb a number of British vessels in the North Sea, the largest attacked being the Belgian relief steamer *Elfland*. After the attack of 11th April, 1915, upon the *Sercula*, which resisted with rifle fire, the Germans appear to have tired of the game. "Later events," says Sir Archibald Hurd,¹ "suggested that the Germans regarded these attempts with aircraft as unsatisfactory and this conclusion reacted on their policy, for such attacks were in future spasmodic—mere casual incidents of the war in the North Sea."

In 1917, however, torpedo-carrying seaplanes were used in that sea by the Germans and scored one or two successes but suffered losses also. The steamer *Gena* was sunk by a torpedo from a seaplane on 1st May, 1917, and the *Kankakee* was sunk on 13th June; the former succeeded in bringing down one of the attacking seaplanes with her gun before sinking. In July the *Haslingden* beat off an attack by four seaplanes, one of which she brought down; the crew of this seaplane and that of another which came down to rescue the occupants of the first and

¹ *The Merchant Navy*, 1921, I, p. 295.

could not take off again, were captured by an armed trawler. In September, 1917, the *Storm* was sunk by torpedoes and bombs launched by aircraft.

Torpedo-carrying seaplanes were used on our side also, and with some measure of success. In the Dardanelles operations on 12th August, 1915, Flight Commander C. H. K. Edmonds successfully fired a torpedo, which had been slung longitudinally under the fuselage of a Short seaplane, at a 5,000-ton supply ship which, says Mr. H. A. Jones,¹ "earned fame as the first vessel in history to be torpedoed from the air." On 17th August he repeated his feat, setting fire to a steamer, which was gutted and eventually taken to Constantinople. Flight Lieutenant G. B. Dacre sank a large steam tug with a torpedo launched from a Short seaplane at about the same time.

"Unhappily," says Mr. H. A. Jones,² "the torpedo-loaded Short seaplane could only be made to get off the water and fly under ideal conditions. A calm sea with a slight breeze was essential and the engine had to be running perfectly. Further, the weight of the torpedo so restricted the amount of petrol which could be carried that a flight of much more than three-quarters of an hour was not possible. So it came about that while a number of torpedo attacks from the air were attempted, only three were successfully concluded."

¹ *The War in the Air*, II, p. 64.

² *Ibid*, p. 65.

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Various kinds of torpedo aircraft were built by us during the war—the Sopwith “Cuckoo,” the Short “Shirl” and the Blackburn “Blackbird” were the chief—but a torpedo squadron was not actually completed until just before the Armistice. In the next war, if naval operations take place, the torpedo aircraft is likely to be much more in evidence.

During the war there were a few instances of the capture of merchant vessels by aircraft. More than once airships alighted on the water and boarded merchant vessels.

Captain Hollender¹ records an instance in which an airship put a prize crew on board the vessel (a Norwegian one), which was then brought into a German port. German seaplanes, too, on several occasions captured merchant vessels by alighting near them and placing observers on board; Mr. C. F. Snowden Gamble² relates instances of this kind. The capture of at least three merchant vessels was contributed to by the seaplane “Wölfchen,” the seaplane carried by the cruiser-raider *Wolf*; it compelled the vessels, under pain of being bombed, to steer towards the *Wolf*.

There was no more fantastic series of episodes in the Great War than the hunting of that snark, the submarine, by that jabberwock, the aeroplane. It was a grimmer fairy tale than ever Lewis

¹ In Neumann, *Die deutschen Luftstreitkräfte im Weltkriege*, p. 390.

² *The Story of a North Sea Air Station*, pp. 384–5.

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Carroll told, a Jules Verne story outdone, the impossible proved to be possible after all. A lethal machine moving with its human freight below the surface of the sea was preyed upon by another lethal machine which also defied the laws of nature by moving where nothing supported it (though heavier than air) but the air. The machine of the air on occasions destroyed the machine of the under-water. Its hunting ground stretched far and wide. Flying boats from Felixstowe combed the North Sea over an area of 4,000 square miles, known as the "Spider Web," through which lay the path of the U-boats. Here, on 20th May, 1917, a Large America flying boat sank the submarine U.C.36—the first confirmed destruction of a submarine by an aircraft. Eight other submarines were sunk by our flying boats and land planes in 1917 and 1918, and a number of others were destroyed by airships and surface craft working in co-operation.

The Great War throws no light upon a debatable question which will probably not be answered definitely until the next war at sea comes to solve it: namely, whether the successes which aircraft achieved against under-water craft in 1917-18 will be repeated against surface craft in the next. The equation of which the aircraft and the warship are the factors remains unsolved meanwhile.

Since the war, various experiments have been tried for the purpose of determining the effect

of air attack upon warships. The most famous of these was that in which the ex-German *Ostriesland* was sunk by United States aircraft with a 2,000-lb. bomb. The experiment has been hailed as the doom of the warship, which, the claim is made, even if it can be made unsinkable, may still be put out of action as the result of damage to propeller, shafting, rudder or condenser doors. The various experiments have on the other hand been denied all validity as evidence of actuality. They cannot serve, it is contended, as a forecast of what is likely to happen in war, when the conditions will be very different from those in which the vessels were in fact bombed. Presumably all such matters and such scanty and really negative evidence as the Great War furnishes were taken into account by the Sub-Committee of the Committee of Imperial Defence on the Vulnerability of Capital Ships to Air Attack, the report of which was published as White Paper Cmd. 5301 on 5th November, 1936. The Sub-Committee placed on record the two opposing views in regard to the effect of air bombing or other attack, and came in the end to a conclusion which might be criticised as carrying the whole matter not very much farther than it was before the Sub-Committee began its deliberations.

The Sub-Committee held that "in circumstances favourable to an attack from the air which could be driven home by a large and

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powerful force the most heavily armoured ship could no doubt be destroyed or at least seriously crippled." Whether such a combination of circumstances was likely and what degree of success would be attained by the attacking forces must be, the Sub-Committee stated, a matter for speculation. Capital ships were in any case essential to our security. Their place in the protection of our trade routes could not be taken by aircraft. More than half of our merchant ships sunk by surface craft in 1914-18 were sunk more than 500 miles from British territory, and, even granting an increase in the future in the radius of action of aircraft, an immense addition to our air establishments all over the world would be necessary if aircraft were to replace warships in the service of safeguarding maritime commerce. No partisan of the air, it was pointed out, had put forward the claim that all naval forces are doomed to destruction and that air power can take over all the tasks of the Navy.

As a whole, the report amounted to a rebuttal of the claim that air power has as yet successfully challenged the primacy of the mightiest of the weapons of sea power.

The part which air power played in the Great War was (as already stated) mainly a subsidiary or secondary one. It was largely ancillary to the work of the armies on land. Even the attacks on aerodromes, railways, junctions and various other objectives behind the front could be regarded

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as falling within the category of services rendered to the troops in the line, for such attacks had the effect of disturbing and disorganising the machinery of supply and relief or of destroying or diverting forces or *matériel* which would otherwise have been available in the battle zone.

Perhaps the greatest exploit of the air in this category of air attacks stands to the credit of the German aircraft which bombed the British ammunition dump at Audruicq on the Calais-St. Omer railway on 21st July, 1916. The result was the destruction of twenty-three ammunition sheds and eight thousand tons of ammunition and the tearing up of a mile of railway track. "It was a success of the first importance," says Mr. H. A. Jones.¹ The German bombing attacks of 19th to 22nd May, 1918, upon No. 12 Ordnance Depot at Blarges and No. 20 at Sagneville were hardly less destructive. The first caused the destruction of 6,000 tons, the second of 5,600 tons of ammunition. The raid of 11th August, 1918, by nine German aircraft upon Calais was also very damaging in its military effect. It started fires which destroyed mechanical transport stores to the value of nearly £1,250,000—nearly as much as that caused by all the fifty-two aeroplane raids upon Great Britain—and, says Mr. Jones, the official historian, made the transport position on the western front exceedingly grave.

¹ *The War in the Air*, II, p. 441. Aerial photographs of the depot before and after the bombing may be seen in Neumann, *Die deutschen Luftstreitkräfte im Weltkriege*, 1920, pp. 441-2.

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The destruction of 29 aeroplanes in a raid upon Dunkirk in October, 1917, and of 27 aeroplanes and 25 engines in one upon Marquise in September, 1918, were other notable achievements of the German air forces.

Army co-operation embraced not only spotting for the artillery and reconnaissance but, very often, work which was practically that of ground troops. "Ground strafing" became a recognised part of the duties of aircraft. The Germans had machines, heavily armoured, for this kind of work; our own Sopwith "Salamander," specially designed for the same purpose, had not appeared in service when the war ended.

In the German break-through of March, 1918, our airmen acted, in effect, as infantry, fighting a delaying or rear-guard action. Sir Douglas Haig stated in his despatch:

"Not content with destroying the enemy in the air, they have vigorously attacked his infantry, guns and transport with bombs and machine-gun fire, and in the fighting south of the Somme in particular gave invaluable assistance to the infantry by these means on numerous occasions. In addition, the usual work of reconnaissance, photography, artillery co-operation and bombing has been carried out vigorously and with remarkable results."

In March, 1918, says Liddell Hart¹:

"Aircraft squadrons attacked the enemy's marching columns and their transport with such effect as to be one of the main factors in paralysing the German onrush towards Amiens. The use of aircraft was merely a diversion, compelled by the

¹ *When Britain Goes to War*, 1935, p. 104.

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emergency, from their recognised subsidiary rôle of serving as the eyes of the armies or blinding the eyes of the enemy. But in the closing months of the war it was air attack, again and again revived, which dispersed the retreating columns of the Bulgars, Turks and Austrians, in turn, into fugitive mobs."

In the three instances to which Liddell Hart refers our airmen turned a retreat into a rout. They caught the Second Bulgarian Army in the Kresna Pass on 28th and 29th September, 1918, machine-gunned it from a low altitude and reduced it to a state of utter demoralisation. A month later, after the Italian victory at Vittorio Veneto, when the Austrians were retreating on the Conegliano-Pordenone Road, our air squadrons again took their part in the pursuit, pouring 30,000 rounds of small arm ammunition and three and a half tons of bombs upon them, again with terrible effect. "Subsequent examination of the road," says Major-General the Hon. J. F. Gachorne-Hardy,¹ "almost forced the observer to the conclusion that this form of warfare should be forbidden in the future."

It was in the operations against the retreating Turks that the air arm achieved its most spectacular triumph. It caught the Turkish Seventh Army in a ravine such as that in which the Carthaginians trapped the marching legions of Rome at Lake Trasimene. Dense masses of troops were observed by air reconnaissance on the road running north-east from Nablus on

¹ Quoted by Slessor, *Air Power and Armies*, 1936, p. 103.

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21st September, 1918. Cavalry had blocked the road to Beisan, but that leading to the Jordan could not be closed by our troops in time, nor could the crossings of the Jordan itself be reached by ground forces. The Royal Air Force rose to the occasion. Our Bristol Fighters, D.H.9's and S.E.5A's rained bombs and machine-gun bullets on the column; throughout the day nine and a quarter tons of 112-lb. and 20-lb. bombs were dropped and 56,000 rounds of machine-gun ammunition were fired. "The attack degenerated into a slaughter which made many pilots sick who took part," says Mr. H. A. Jones.¹ "It was sheer butchery," says an officer of No. 1 Squadron, Australian Flying Corps, who took part in the attack.² "This was the Air Force's war, and what a hateful war it was. . . . We were a tough bunch, but we were sickened. The infantry, hardened warriors that they were, were absolutely appalled when they came up." Crashed lorries, maddened horses, disabled guns, dead and mutilated men were piled in inextricable confusion. The Turkish Seventh Army was smashed to pieces by the concentrated might of air power.

Of the aircraft which were engaged only one D.H.9 was a bomber. The Bristol Fighter was an army co-operation machine and the S.E.5A a fighter. If machines of these types were able to bring about such a debacle, what may not be

¹ *The War in the Air*, VI, p. 225.

² L. W. Sutherland, *Aces and Kings*, 1936, pp. 256, 260.

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accomplished by heavy bombers against concentrations of troops and their transport in the next war ?

Nor will that be all. Aircraft will be able, as Liddell Hart points out,¹ to do what the Belgian engineers did in the path of the German advance in 1914, when they destroyed the bridges over the Meuse and thus delayed and disorganised the advance, and to do it *behind* as well as before the invading columns. Heavy bombs from aircraft or demolition parties transported by air will be able to throw the whole machinery of supply and re-equipment into confusion. "The result may be not merely embarrassing, but disastrous."

No more significant lesson is taught by the Great War than that to which Liddell Hart draws attention here. The destruction of the Turkish Seventh Army and the other incidents referred to above are full of omen for the future, more particularly because they point to the enormous potentiality of air attack concentrated upon an army's lines of communications. Air power was then, be it remembered, hardly more than a child. The young David challenged the mighty Goliath of land power. Grown to full stature, what may not the stripling of 1918 accomplish in a future war ?

Beyond question the great armies of the recent past, unwieldy, cumbrous, slow, dependent on a complicated network of supply for their

¹ *When Britain Goes to War*, pp. 63-4.

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food and arms, must be a terribly vulnerable target for the arrows of the air. To what extent the position will be affected by the mechanisation of ground forces and their reduction in size is a matter for speculation. The duel between the "new models" in the air and on the ground will be an extraordinarily interesting one to watch. Lines of communication, however, there must always be, and these are certain to be a prime objective of air attack.

CHAPTER III

THE DOUHET AND OTHER POST-WAR DOCTRINES

AIR power had not evolved a philosophy of its own when the Great War ended. It has been trying to do so ever since and it has not, indeed, succeeded as yet ; or, rather, it has evolved, or has had evolved for it, rival philosophies which are mutually destructive. There has been a battle of ideologies which will probably only be decided—if then—when the venue is shifted from the study to the clouds and the pen has given way to the bomb.

On one side air power has been hailed as the inheritor of the pride of place which land power and sea power have held in the past. The “ far bell ringing at the setting of the sun ” may indeed tell of “ renown for ever clinging to the great days done ” ; but those days *are* done, say the champions of air power, and if we were not wilfully deaf and foolishly sentimental we should listen not to that ancient bell but to a newer and clearer note which sounds the knell of the old order in war. Armies and fleets, if not obsolete and fit only for the scrap-heap, are at least relegated to a secondary place in the armoury of nations. It

is only common sense to recognise that truth, however unpalatable to conservative thought.

On the other side are those who deny that it is the truth. Nothing, they say, has come to pass which justifies the extravagant claims made on behalf of the air arm. Flight has merely added a new weapon and a new technique to the instruments and methods of war: as gunpowder did in the fourteenth and fifteenth centuries, as steam, the rifling of ordnance and the explosive shell did in the nineteenth. Wars must still be fought and won on land and sea, not in the air. The day of armies and fleets is still far from being ended.

Foremost and most famous among the preachers of the gospel of air power has been the Italian general, Giulio Douhet, who was born in 1869 and died in 1930. The great strategic principle which he popularised has been summed up by M. Etienne Riché, former Under-Secretary of State for National Defence in France, in the preface to *La Guerre de l'Air*, as amounting simply to this: the defensive on land and sea, the offensive in the air. All effort, he held, must be concentrated on the air battle. It was there that wars were to be won. The older arms were merely a screen, a barrier behind which air power could prepare its assault.

The Blue Sky school—as it may be called which Douhet founded made claims for air power more far-reaching than those made by the Blue

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Water school for sea power in the days before the war. "A static military condition and intensive air activity," is the summary description of the doctrine given by one of its most distinguished adherents, Air Commodore L. E. O. Charlton. Armies and fleets would be needed, Douhet admitted, if the "army of the air" were not sufficiently strong to break the moral and material resistance of the enemy after it had won the mastery of the air; but then the "army of the air" *ought* to be made strong enough to accomplish this supplementary task. It would do so by attacking the enemy's junctions, railroads, ports and in general his "economic organisation." The Douhet doctrine led naturally to the conception of *la guerre totale*, of war on a nation as a whole, not on its armed forces. It was a theory of direct action, an appeal—by bomb—to the Cæsar of the man in the street, the citizen, the voter, the man upon whose decision, taken in the mass, the issue of a war depends.

A valuable analysis of the Douhet doctrine is to be found in the recently published book of Herr Fischer von Poturzyn.¹ The doctrine, he points out, is based on the principle that on land and at sea defence is easy under modern conditions, while attack is costly and difficult; and with the increasing effectiveness of armaments

¹ *Luftmacht : Gegenwart und Zukunft im Urteil des Auslandes*, 1938, pp. 56-8.

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the advantage of the defensive is becoming more pronounced. On the other hand, no real defence is possible in the air, and the air, therefore, should be the domain of attack. That is the domain in which the way to a decision must be sought, and the army of the air must be sufficient for this vital task. Not an aeroplane should be withdrawn from it for duties ancillary to those of the army and navy. The aim should be to secure predominance in the air, and with this end in view the main function of the air force should be to annihilate the ground organisation of the enemy air force, its aerodromes and factories. Battle can be evaded in the air and time should not be wasted in seeking to bring the opposing air force to action; the necessary hegemony in the air must be won by destroying the bases of the enemy's air power. The bomber will be the instrument *par excellence* for employment upon this service, and the number of fighter and observation machines should be limited to the smallest possible number, so that the bombers can be provided in sufficient mass. Douhet, says von Poturzyn, dethroned the fighter and put the bomber in the first place. It is the bomber which will win predominance, and once that is won the way to final victory will be easy.

The new theory of victory through direct air action was only one of the reactions—the war poetry of Siegfried Sassoon was another—from the weariness and disillusion induced

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by the long war of attrition towards its end. Dr. J. Holland Rose¹ pointed out that war had become a condition of deadlock, of stalemate. Armies dig themselves in, fleets evade action.

“Wearied by their long drawn-out and ineffectual struggles, inventors are turning their attention to the civil populations. As fleets do not effectively grapple, submarines and aircraft are to assail merchantmen and cut off the needed supplies from overseas. As armies slowly wear each other down, aircraft are to pass them by and deal with the large cities—direct action with a vengeance. These developments open up hideous vistas.”

The new doctrine has been well summarised by one to whom it is anathema. “What, it is asked,” says Admiral Sir Herbert Richmond,² “is the ultimate object in war?”

“It is to overcome the will of the enemy people. Hitherto that will has been overcome either by the occupation of their country, or by interruption of their external lines of communication; or, more commonly, by a combination of both measures. . . . None of these services [armies and navies], according to the new doctrine, will be needed in the future. It will not be necessary to overcome opposing armies in order to enter a country or exercise pressure upon the people. Attack on the people themselves can now be made directly, without any need of overcoming a defending force. Air forces will bombard the great centres of life and industry, the organisations of transport, water-supply and other internal national services, the administrative establishments and the civil population itself. It is action in this form which will decide the issue.”

¹ *The Indecisiveness of Modern War*, 1927, p. 48.

² *Sea Power in the Modern World*, 1934, pp. 100-1.

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Developments of the Douhet doctrine are to be found in the works of a number of writers in the old world and in the new, and in some of the more extreme forms it has become almost a gospel of *Schrecklichkeit* from the air. One of its most perfervid advocates has been the American Brigadier-General William Mitchell. In his book¹ he suggested that aircraft operating in the heart of an enemy's country would quickly achieve victory by destroying "the means of communication, the food products, even the farms, the fuel and oil and the places where people live and carry on their daily lives."

"In future wars," wrote the well-known German writer General von Altrock in the *Militär Wochenblatt*,²

"the initial hostile attack will be directed against the great nerve and communication centres of the enemy's territory, against the large cities, factory centres, ammunition areas, water, gas and light supplies; in fact, against every life artery of the country. . . . Entire regions inhabited by peaceful populations will continually be threatened with extinction."

"Fleets of aeroplanes," wrote Major-General J. C. F. Fuller,³ "will attack the enemy's great industrial and governing centres. All these attacks will be made against the civil population in order to compel it to accept the will of the attacker."

¹ *Winged Defence*, 1925, pp. 126-7.

² Quoted by Rear-Admiral Sir M. Sueter, *Airmen or Noahs*, 1928,

p. 177.

³ *Tanks in the Great War*, 1920, p. 314.

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Again he wrote¹ : " I have already pointed out that the policy of a nation is founded on the will of its civil inhabitants and that the supreme military power of aircraft is their ability to ' hop ' over armies and fleets and attack what is in rear of them."

The same idea is to be found in one of Major Cliver Stewart's books,² in which he foreshadows a kind of war that will be " a hundred-fold more terrible " than the last. He foresees aircraft attacking " towns and villages, perhaps far from the field of battle, where live and work the civil population," and spreading destruction for the purpose of breaking the will to fight among the enemy population.

Stewart subsequently expounded his doctrine in rather more guarded terms in the *Morning Post*. In a letter to that journal on 14th February, 1936, he brought the bombing of military objectives more prominently into the picture. The " doctrine of central shock," he said, " is simply the doctrine of the bomb." It visualises the shattering of a nation's organisation and life with the bomb, for which our industrial system presents a perfect target in the shape of cities, ports and even shipping.

In at least two of his books, Captain B. H. Liddell Hart has graphically assessed the potentialities which he sees in air power.³ In an early

¹ *The Reformation of War*, 1922, p. 148.

² *Strategy and Tactics of Air Fighting*, 1925, p. 181.

³ *The Remaking of Modern Armies*, 1927, and *When Britain Goes to War*, 1935.

book he pointed out that aircraft enable us to jump over the army which shields the enemy government and people and to strike at the seat of the opposing will and policy. A modern State is such a complex and interdependent fabric that it is a target highly sensitive to a sudden and overwhelming blow from the air. Victory in air war, he holds, will lie with whichever side first gains the moral objective, and if one belligerent wastes time searching for the armed and mobile forces of the enemy, he will see his static centres paralysed before he can win even a military success.¹

In a later book, *When Britain Goes to War*,² Liddell Hart forecasts a mode of war which has an economic and psychological aim but which pursues that aim by striking at military objectives. Aircraft, he holds, came "endowed with a knight's move . . . on the chessboard of war," and their aim will be economic rather than military. This does not mean terrorisation—fear of neutral opinion will be a deterrent against that—but the former distinction between military and civil objectives will no longer be clear. That distinction rested on the simple physical fact that the enemy's armed forces had to be overcome before the country behind them could be reached. Now, air forces can jump over this shield and mechanised forces can slip round it.

¹ *The Remaking of Modern Armies*, pp. 106-7.

² *Op. cit.*, pp. 99, 123.

Ammunition centres in industrial areas, railways and ports are, Liddell Hart points out, all legitimate objectives, and "thus the infliction of military and civil damage, material and moral, will coincide." "In this future warfare, economic in aim, the air is likely to be the predominant partner."

Whether the lighting and water-supply systems of cities could properly be held to come within the category of military objectives contemplated by Liddell Hart is at least open to question, but that direct attacks upon them will be made in future wars has been foreseen by more than one authority. In a lecture on "Air Warfare" given by Air Vice-Marshal (now Chief Air Marshal Sir Robert) Brooke-Popham at the Imperial College of Science, South Kensington, on 9th December, 1926, he drew attention to the results to be achieved by blows at the nerve centres of the enemy's power. The object of war, he pointed out, was to destroy the moral of the enemy nation, and this could be accomplished by attacking such vital centres as docks, water-supplies, lighting and transport centres. The will of the people was the governing factor in modern war, and every effort should be made to break it. He commended the "order for battle" given in the First Book of Kings: "Fight not with small or great save only with the King of Israel."

The concentration of air attack on urban water-supply is also contemplated by the American

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military writers, Brigadier-General H. H. Arnold and Major Ira Eaker.¹ They speak of the "dire results" to a city of the destruction of its water-supply, and it is by action of this kind, they hold, that bombers will achieve the one end desired in war—the breaking down of the will of the people.

Captain Norman Macmillan² is another who attaches importance to air attacks upon the water-supply of cities. The reservoirs of the large towns, he states, are particularly vulnerable; they show up distinctly from the air, by night as well as by day, and they present therefore excellent targets to bombers. A 2,000-lb. bomb dropped near the gates or sluices might deprive a city of its water-supply. Well-directed attacks upon docks, railways and roads would also, he considers, have disastrous effect. He holds that "the days when purely military objectives were sought out have gone. By a ruthless power, bent upon achieving victory in the shortest time, every section of the community is to-day liable to be sought out as a target from the air."

Captain Macmillan, it will be seen, foresees a régime of ruthless warfare in which the whole civil population will be the objective of air attack. A similar view had already been expressed by Sir Charles Dennistoun Burney.³ "In the

¹ *This Flying Game*, 1936, p. 129.

² *The Chosen Instrument*, 1938, pp. 55-6.

³ *The World, the Air and the Future*, 1929, pp. 101, 149.

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future," he wrote, "air power must be the ultimate criterion of a nation's belligerent strength," and it will use its might mercilessly. Within perhaps a week it could destroy London and all the major towns of this country. To talk of international law is futile when a country is all "one huge arsenal." "Logically, the extermination of the civilian population is a legitimate object of modern warfare; for every belligerent country is in a state of siege."

Brigadier-General P. R. C. Groves takes a no less realistic view of the war of the future.¹ He warns us that we have to reckon with an entirely new strategic weapon which has disestablished the "hoary maxim" that victory can be won only by the defeat of the enemy's armed forces. The new war will be a "war of areas," not of fronts, and any State which lacks means of defence and is at the same time, for geographical and industrial reasons, peculiarly exposed to attack, must quickly be obliged to accept defeat. The air attack which he foresees would not be limited to power stations, docks, war industries, aerodromes and similar *quasi-military* objectives. "Certain it is that if Europe should again go to war the conflict would not be governed by humane considerations."

That, too, was the view of the late Lord Thomson, twice Secretary of State for Air.²

¹ *Behind the Smoke Screen*, 1934, pp. 143, 159, 186.

² *Air Facts and Problems*, 1927, p. 26.

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He foretold that war between States with highly-developed aircraft industries would be fought mainly in the air, and that the way to win would be the ruthless bombing of densely populated centres. He foresaw as a result, for victors and vanquished alike, "ruined cities . . . hospitals filled with the maimed and mutilated of all ages and of both sexes, asylums crowded with unfortunate human beings whom terror has made insane."

Intensive air bombardment of great centres of population as the main operational effort of any future war is also foreseen by Air Commodore L. E. O. Charlton.¹ In his view, armies are obsolete for purposes of offence; their function is to provide a screen from behind which the air arm can launch its attacks. Fleets, in face of this new menace to the cities, will be only so much "tin ware." Youth must be served, and air power is young. Whether it need be quite so ferocious is another matter.

That navies and armies are obsolete except for the undertakings of functions subsidiary to that of the air arm is the view expressed also by Captain J. R. Kennedy.² Only the air arm, he considers, can attack successfully under modern conditions of war, "the man with the bayonet and the battleship being no longer capable of assault." We should base our tactical organisation

¹ *War from the Air : Past, Present and Future*, 1935, and *The Menace of the Clouds*, 1937.

² *Modern War and Defence Reconstruction*, 1936, pp. 202, 203, 207, 209.

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on an instrument which is capable of decisive action against land *and* air forces on the one hand and sea *and* air forces on the other. Therefore, our main decisive weapon must be three-dimensional, or, in other words, the aircraft. "The fast and numerous bomber can be our basic weapon and round it we can build up our organisation." No other form of attack offers anything like the decisive effects which can be attained by the swift bomber.

The doctrine of direct air action, with its corollary that fleets and armies are relatively unimportant in war to-day, was naturally a sheer heresy to the older school of military thought. The naval writers were not slow to reply. They proceeded to carry the war into the enemy's camp and to try to "debunk" air power. Foremost among them was "Neon," whose book¹ was for half its length a destructive examination of the claims made for the airship—and here "Neon" has been proved a true prophet by the event—and for the rest a studied and much less convincing denigration of air power in general. The argument used was that aerial bombing is necessarily indiscriminate, barbarous, inherently expensive, and "utterly ineffectual so far as winning the war is concerned." It is indeed "the hooliganism of war." "The real battle—the battle which determines the final result—is on the ground or on the sea."²

¹ *The Great Delusion*, 1927.

² *Op. cit.*, p. 176.

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The mantle of "Neon" descended miraculously on Captain Bernard Acworth, whose book¹ was again a determined attack upon the air arm and all its works and a glorification of sea power : that is, sea power as understood by a certain school of naval thought and not that to which the late Lord Fisher and certain Lords of the Admiralty subscribed.

Before this, Admiral Sir Richard Custance had dealt in a more cautious temper with the question whether the air arm—the "aery" as he called it—is really an independent arm.² He came to the conclusion that it is not, since its independent action is limited to those exceptional cases where "the opposing armies are based on land and operate across the sea." These exceptional cases, in Admiral Custance's view, did not justify us in ignoring the fact that, as a rule, the rôle of the "aery" must necessarily be an ancillary one. His conclusion was thus a refusal to admit the claim of the Douhet school of thought.

Still earlier, Admiral Sir Herbert Richmond, in a lecture delivered at the Royal United Service Institution, in February, 1923,³ had examined the new doctrine of the war of areas, which, he said, involved attacking the civil population, and condemned it on ethical as well as strategic grounds.

¹ *The Navy and the Next War*, 1934.

² *A Study of War*, 1924, pp. 91-2.

³ *National Policy and Naval Strength*, 1928, p. 187.

"Frightfulness," he stated, "expressly repudiated recently in the case of sea warfare"—the reference was to the Submarine Rules embodied in the Washington Treaty of 1922—"appears to be a fundamental principle in the air."

In a later book¹ Admiral Richmond devotes a chapter to an analysis of the claim that air has superseded sea power. "If," he says, "it be a fact that wars in the future will be decided by direct attacks upon the civil population; and if it be also true that the fundamental principle of the strategy of war is not, as it is on land and at sea, to overcome the armed forces of the opponent, then it would follow that warfare will consist in an intensive process of cross-raiding between the opponents.' He quotes examples from a number of wars in support of his contention that a decision is unlikely to be reached in this simple way.

The late Earl Beatty, too, lent his powerful aid to the campaign against the new doctrine of warfare. In particular, in a letter to *The Times* of 2nd May, 1930, he criticised "the adoption, as a basic war aim, of attack on enemy non-combatants." It was, he held, a fallacious aim, which could not lead to victory, was inexpedient for Britain and was unacceptable to the great body of Englishmen.

Earl Beatty rejected the doctrine of direct air action as being un-English. It has been

¹ *Sea Power in the Modern World*, 1934, pp. 103-4.

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rejected in the United States by representatives of the Army and Navy as being un-American. When the Dwight Morrow Aircraft Board was taking evidence in 1925, Major-General C. P. Summerall, commanding the 2nd Corps area, said that much had been heard about bombing of cities, but that he did not believe that the United States was preparing to make war in such a fashion. The bombing of areas occupied by non-combatants and defenceless people would be contrary, he held, to the laws or rules of war. The only true objective was the enemy's army. "If that falls everything falls. . . . A bombing expedition must be made as something connected with the enemy's armed forces."

Captain W. S. Pye, U.S. Navy, of the War Plans Division, Washington, asked at the same hearings whether the United States, which fought for the sanctity of treaties, was to adopt the theory of ruthlessness in the air and "to become the 'baby killers' and the 'Boches' of the future." The civilised world, he suggested, would stand aghast at such a decision by the United States.

Brigadier-General H. H. Arnold, of the Air Service, repudiated on behalf of that service any intention to bomb defenceless towns and women and children. The objectives, he stated, would be ammunition factories, disembarkation points, supply bases, railroad depots, and other places which were "actually assisting the enemy with his preparations for war."

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It is thus evident that service opinion in the United States as a whole would not endorse the doctrine of direct air action in its extreme form. The few military writers who, like Brigadier-General William Mitchell, have allowed the Douhet doctrine to bolt with them, are not representative of American thought in general.

The Douhet doctrine has been challenged also by military thinkers on the continent. In France, General A. Niessel¹ questions the capacity of the air arm to accomplish all that is claimed for it. The humble *fantassin*, he holds, must still decide a war in the end.

Another French writer, Colonel Rousseau² goes further in his criticism. Douhet, he says, did not live to see the development of tanks and anti-aircraft batteries; if he had he might have modified his opinion. As they stand, his teachings, Rousseau holds, are based on dangerous assumptions—assumptions in regard to the possibility of achieving supremacy in the air and the results that will flow from the exploitation of that supremacy. Indeed, in the attempt to destroy the enemy's air power, says another authority quoted by von Poturzyn, the Austrian General Eimannsberger, a country's own air force may suffer such losses that it will have no margin of strength left over to inflict upon the opposing army and the industrial centres of the enemy

¹ *La Maîtrise de l'Air*, 1928, pp. 216, 221-2, 238.

² Quoted by von Poturzyn, *Luftmacht*, 1938, p. 64.

country damage sufficient to produce a decisive issue of the conflict. Within two months, General Eimannsberger points out, the whole peace establishment of aircraft and their crews may have disappeared; and the impossibility of replacing highly qualified men is an essential weakness in an air force actively engaged.

The conclusions of Douhet, von Poturzyn quotes Marshal Pétain as saying, cannot safely be generalised. He was speaking in terms of Italian conditions and his theories are not necessarily applicable as they stand to other countries. Nevertheless, the Marshal adds, many constructive ideas are to be found in his teaching and "it would be unwise to belittle as a Utopian and a dreamer a man whom later generations may acknowledge to be a true pioneer."

Douhet, says von Poturzyn, undoubtedly over-rated the strategic possibilities of his army of the air. His theory of air power was based on gigantic assumptions in regard to the effectives of *personnel* and *matériel* that would be available for the mass operations in the air which he contemplated. His great merit, says von Poturzyn, was that he formulated a new and wider conception of air warfare and his impetus it was which led to a reconsideration of the principles of modern warfare as a whole.

General N. D. Golovine¹ reaches the conclusion that Douhet was wrong in holding that the

¹ *Air Strategy*, 1936, pp. 4, 7.

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action of the army and fleet can be confined to defence of the frontier and the coastline, in advocating the suppression of all air forces ancillary to the land and sea forces, and in claiming for the "air army" powers which are in fact beyond its capacity.

The views of these and other writers of the moderate school of military thought are, in fact, an endorsement of the verdict of the Morrow Board in its report to the President of the United States on 30th November, 1925. The Board recorded its dissent from the contention that wars against high-spirited peoples could be won by "sudden attacks upon important nerve centres such as manufacturing plants, depots, lighting and power plants and railway centres. The last war taught us again that man cannot make a machine stronger than the spirit of man."

Brave words, these, but is the antithesis quite logical? It is the spirit of man, too, that makes and uses the machine, and the machine, throughout history, has been the instrument of victory: that is, the machine—even the flint battle-axe or the Maglemose harpoon was a machine—which is a little better than the enemy's machine.

In substance, however, the Morrow Board's conclusion is evidently that also of the responsible statesmen of all countries. We and other nations would not be spending hundreds of millions of pounds upon armies and fleets if the governments, at least, considered that they had become obsolete

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and that all that was needed to win a war was an air armada. Equally, we should not be spending hundreds of millions on aircraft and air defence if air power were as negligible a factor in war as its hostile critics contend.

The truth lies somewhere between the extremes—extremes that might be caricatured, at one end, as the old-fashioned idea that air forces are of no great value and, indeed, barely respectable unless they are chaperoned by armies or fleets, and, at the other, as a claim for the young and inexperienced air arm of the right to live its own life and not have its style cramped by its elders. We shall probably not know until the next war comes and goes exactly at what point between the extremes the truth has concealed itself. For the present—and subject always to the very important proviso that our own action may have to conform to the enemy's action, which is not always calculable—we should be wise to adopt the cautious conclusion which Slessor arrives at upon this particular matter.¹ He says that as air forces increase in strength and efficiency, and if field defences become more impregnable, it may come about that belligerents will undertake no offensive operations on the ground. Armies will then become frontier garrisons, and air forces, from their cover, will try to reduce the enemy to impotence by attacks on his essential services and centres of war industry and transportation.

¹ *Air Power and Armies*, 1936, p. 80.

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If, however, the enemy does undertake a land invasion, perhaps by great armoured forces supported by air action, air attack on the sources of supply of those forces will not be sufficient to bring about a decision, simply because of the time-lag in its effect. Air action against production will not obviate the possible need for further offensive on the ground.

In other words, there may in the future be circumstances in which the air arm will prove itself capable of winning a war off its own bat, and, this being so, to deny it a place among the highest in the team would be the extreme of folly. But meanwhile there are circumstances, now existing, in which it will clearly not be able to win without the support of the other arms, and so long as this remains the position it is folly to speak of those arms as obsolete. Whether in *either* of the two sets of circumstances in question it is the best policy for the air arm to adopt the doctrine of *la guerre totale*, or whether a method less youthfully and arrogantly contemptuous of the accepted practices of war may not be found to pay best in the end, must be left for consideration in Chapter VIII of this book.

CHAPTER IV

THE ATTEMPT TO STRANGLE AIR POWER

At times during the years 1932 and 1933 it seemed that no air power might be left to have any influence, good, bad or indifferent, on the next war. Air power was to be outlawed, proscribed, abolished. It was to be solemnly banned with bell, book and candle.

In retrospect it may seem that what happened at Geneva in those years can now safely be dismissed as having no further practical importance. That would be a mistaken view. The proposals which were then made, or some of them, may be revived. Some form of restriction upon bombing is quite certain to come under international discussion again. If it is agreed to—and observed—it will clearly affect the future influence of air power upon war. The situation will be altered still more fundamentally if all bombing, *a fortiori* if all air warfare, is abolished; but that seems to be a less likely development.

The Disarmament Conference of 1932-34 is a maze in which the student is likely to lose himself. It is full of blind alleys and passages that double and lead nowhere, of contradictory signposts and

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misleading directions, of apparent inconsistencies and illogicalities. One can only begin to find one's way if one first grasps clearly the ideas which those who fashioned its intricacies had in mind.

The proposals which were made at Geneva for dealing with the air menace were based on certain data. The data were these :—

The air menace is the menace of the bomber.

It is a menace more particularly to the civil population.

Military aircraft not specially designed as bombers can be used for bombing.

Civil aircraft can be converted for use as bombers.

From these data it followed that the menace could have been dealt with in different ways, of varying degrees of comprehensiveness.

The States might have been content to make a modest beginning and simply to agree not to use their bombers against civil populations.

They might have gone further and agreed not to use bombers at all—even against military targets.

They might have gone still further and agreed to maintain no military aircraft, whether for bombing or for any other purpose.

Finally, they might have combined prevention of bombing with peace preservation and handed over their bombers to an international authority,

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who would alone have the right to use them, for the purpose of preventing aggression.

The proposals submitted at Geneva embraced these various devices for the solution of the problem. They are described hereafter, in *reverse* order, as *Methods A, B, C* and *D*.

Nearly all the proposals made encountered in turn the difficulty referred to among the data enumerated above, namely that civil aircraft can be used for warlike purposes. The General Commission of the Conference appointed an Air Committee on 23rd February, 1932, and this Committee reported on 8th June that in its opinion, "civil aircraft, to the extent that they might be incorporated with the armed forces of a State, could in varying degrees subserve military ends." It also held that the aircraft which constituted the greatest threat to the civil population were "aircraft able to drop or launch means of warfare," that is, bombing or torpedo aircraft, and that such aircraft were at the same time the most efficacious against national defence. The close interconnection between civil and military aviation as factors in the problem was thus established.

Clearly the most satisfactory way—if only it is practicable—to deal with the bombing menace is to prevent war from breaking out ; for bombing is only an incident of war. This was the way proposed in the most ambitious of the schemes submitted at Geneva, now to be explained.

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Method A. The pooling of bombers.

The French scheme submitted to the Conference in February, 1932, and revised in the following November, was a comprehensive one which embraced the prevention of aggression in any form and provided not only for an international air force (in which alone bombing aircraft would be allowed) but for specialised contingents of land forces, armed with powerful guns and tanks, to be held at the disposal of the League of Nations. The international control of civil air transport in Europe was an essential part of the scheme. It thus embodied the principle, which the Air Committee's report in effect confirmed, that to abolish national air forces and to leave civil aviation uncontrolled would be to fail to remove the potential menace.

The French scheme embraced, therefore, more than one very contentious proposal. The establishment of an international force was obviously one ; the control of civil aviation was found, on examination, to be hardly less difficult of acceptance. The revised French scheme was considered in February and March, 1933, by an Air Committee of twenty members representing the States chiefly interested in aviation, and signs soon were apparent that no agreement could be reached within this Committee. Some of the delegates were in any case without instructions upon this subject from their Governments, and accordingly on 17th March, 1933, the chairman

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of the Committee expressed the view that the discussion could not usefully be continued until it was known whether any Powers declined to agree to any interference with their civil aviation and whether such Powers were prepared nevertheless to agree to the abolition of (national) military aviation. The delegations of the United States, the United Kingdom, Italy and Japan thereupon moved that the Committee should adjourn in order to allow the delegations of distant countries to consult their Governments.

Then the story comes to an abrupt end. The Air Committee never met again. *Method A* was decently—or perhaps not too decently but certainly quite inevitably—buried. It never had a ghost of a chance of general acceptance.

Method B. The abolition of military aircraft.

Proposals for the abolition of military aircraft were put forward by the delegations of Germany, Denmark, Sweden, Spain, the Soviet Union and the Hedjaz during the early proceedings of the Conference in February, 1932. Here, again, the position was complicated by the difficulty already referred to—that of ensuring that civil aircraft were not used for warlike purposes. The immediate abolition of military aviation was soon found to be an unattainable project, so far as Geneva was concerned. In the view of the British Government, however, there was some prospect of better success if the proposal were examined

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separately by the principal air Powers, and in a White Paper (Cmd. 4189) issued in November, 1932, containing a Declaration of Policy of His Majesty's Government upon disarmament, a recommendation to that end was foreshadowed. Actually, a different line was adopted in the draft Convention which the British Government eventually submitted to the Conference, on 16th March, 1933. Article 35 of this Convention provided that the Permanent Disarmament Commission which was to be set up later should devote itself to working out schemes for the complete abolition of military and naval aircraft, the abolition to be dependent on the effective supervision of civil aviation in order to ensure that it was not misused for military purposes.

So far as the Conference was concerned, the question was thus, in effect, nicely shelved. *Method B* followed *Method A* into oblivion. It was, again, an impossible scheme from the first.

Method C. The abolition of bombing.

The proposal to prohibit all bombing was less impracticable and came nearer to adoption than those referred to above. It made, indeed, quite remarkable progress (for Geneva) as compared with the premature fate of the proposals here denominated *Methods A* and *B*. It reached the stage of being embodied in a resolution of the Conference the effect of which was to pronounce

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a sentence of death upon air bombardment subject to a suspensory clause which might or might not have been found on further examination to amount to a nullifying clause. Actually, so far as the Conference carried the matter, it did prove to be a nullifying clause, but that may not be the end of the story. The proposal may be revived in the future.

At a later stage in the Conference, as is explained below, the British Government put forward a proposal for the prohibition of bombing subject to a reservation in regard to bombing for police purposes. The effect of that reservation has been misrepresented ; it was, in fact, of no real consequence, as the particulars given below show clearly.

The history of the attempt to abolish bombing is this :—

When the Conference met in February, 1932, the Netherlands delegation proposed that bombing should be abolished, and the delegations of Austria, Belgium, China, Hungary, Italy, Portugal and Switzerland proposed that bombing aircraft should be abolished. Once again that *enfant terrible*, the question of the possible misuse of civil aircraft, came gate-crashing into the debate upon the allied question.

On 23rd July, 1932, the General Commission of the Conference adopted, by 41 votes against 2, with 8 abstentions, what is known as the Benes Resolution, one provision of which, in two parts,

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related to air bombardment. The *first* part will be referred to under *Method D*, below. The *second* part was as follows :—

“ 2. The High Contracting Parties agree as between themselves that all bombardment from the air shall be abolished, subject to measures to be adopted for the purpose of rendering effective the observance of this rule.

These measures shall include the following :—

- (a) There shall be effected a limitation by number and a restriction by characteristics of military aircraft ;
- (b) Civil aircraft shall be submitted to regulation and full publicity. Further, civil aircraft not conforming to the special limitations shall be subjected to an international régime (except for certain regions where such a régime is not suitable) such as to prevent effectively the misuse of such aircraft.”

Here, it will be seen, the principle of the abolition of bombing was accepted, but accepted subject to the fulfilment of certain conditions, one of which—that relating to the control of civil aviation—was soon found (as already stated) to be unacceptable to a number of States, who objected to any interference with their civil aviation. It was for this reason that in the draft convention which the British Government submitted to the Conference in March, 1933, the conditions attached to the Benes Resolution were not reproduced.

Article 34 of the British Draft Convention provided for the abolition of all bombing from the air “except for police purposes in certain outlying regions.” The reason for the reservation

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was perfectly obvious. It was to enable bombers to be used—and lives to be saved in consequence—upon the North-West Frontier of India and in other like regions. The idea, carefully fostered for political reasons, that the reservation was cleverly tagged on in order to ensure that the main part of the article should come to nothing is pure moonshine. If that had been true we should not have been willing to jettison the reservation the moment it appeared likely to sink the substantive proposal. “We have always stated,” said Mr. Chamberlain in the House of Commons on 23rd February, 1938, “that we would be prepared to stop bombing from the air altogether if others would agree.” This, assuredly, was not the rock upon which the proposal foundered.

Reference to the records of the Conference proves that a number of other Powers made agreement to the prohibition of bombing conditional upon agreement on other points. Japan would not accept such a prohibition unless aircraft carriers were abolished and the fitting of war vessels with landing decks or platforms for aircraft prohibited. Other countries regarded Article 34 as being closely linked with Article 35 (referred to under *Method B* above) and insisted upon the need for a settlement of the subject-matter of the two Articles concurrently. France, for instance, considered that the effective supervision of civil aviation was also necessary, since

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otherwise the potential danger from that source would remain.

There is no evidence, but rather the contrary, that general agreement to the abolition of bombing would have been secured if the reservation had been absent from Article 34. That was not the real cause of the *impasse*. It was due to a number of obstacles, of which the British reservation was only one. In any case, as already stated, the British Government were quite ready to withdraw the reservation if it blocked the way to general agreement.

In the House of Commons on 5th July, 1933, in reply to an appeal by Sir Austen Chamberlain, Mr. Eden, then Under-Secretary of State for Foreign Affairs, used these words :—

“ My right honourable Friend has made a new appeal to me. He has said that it would be a terrible thing if the Conference were to break down on this issue. I am heartily in agreement with him on this point. It would indeed be a terrible thing if the Conference were to break down upon this issue. Let me also assure him that there is not the least question of it. The size of the problem in relation to our other problems is minute. . . . I think it occupied four hours of our total deliberations on the subject.”

Mr. Eden returned to the subject again on 11th July, 1935, when he said that our reservation regarding “ police bombing ” took up only four hours’ time out of three years’ work at Geneva and ridiculed the suggestion that “ this entirely insignificant little reservation.” held up the

Conference. It never had, he said, the smallest international significance. "The only importance it has ever had has been for the purpose of party politics at home."

Mr. Lloyd George's statement in the debate of the same date, that we offered to withdraw the reservation only after Germany had left the Conference, is refuted by the dates. Mr. Eden's first statement in Parliament, quoted above, was made on 5th July, 1933; Germany left (and so wrecked) the Conference on 14th October, 1933.

Method D. The restriction of bombing.

It has been stated above that the Benes Resolution which the Disarmament Conference adopted on 23rd July, 1932, was in two parts. The *first* part was :—

" 1. Air attack against the civilian population shall be absolutely prohibited."

There was no real dissent from this proposal. Only two States voted against it—Germany and the Soviet Union—but both did so for reasons unconnected with this particular provision of the Resolution. Eight States abstained from voting, again for reasons not related to the proposal here in question. Only one of them, Italy, was a great Power, and that her abstention was not due to her entertaining any objection to the prohibition of the bombing of civilian populations was made clear by a letter which she addressed

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to the British Government at a later date. This letter, despatched on 4th January, 1934, suggested that a Convention should be signed, to remain in force until 31st December, 1940, for the prohibition of the bombing of civilians. There is very little doubt that a Convention which limited itself to *Method D* would have won practically universal acceptance. So much salvage might have been rescued from the wreck of the Conference. It was a thousand pities that it was not.

The story of the endeavours made at Geneva to abolish or restrict bombing should not be left out of mind in any attempt to assess the effect and influence of air power in a future war. If the most modest of the proposals then made—*Method D*—had been accepted, still more if a more ambitious scheme such as that here described under *Method C* had been adopted, the result would obviously have been to modify in less or greater degree the extent to which a belligerent could lawfully employ his air arm. The effect would not, perhaps, have been very serious if all that had emerged from the Conference had been a measure of regulation, such as the prohibition of the bombardment of civilian centres of population. It is questionable, indeed, whether the use and influence of air power would have been very materially impaired in that event. It is possible that the result would have been to throw the weight of air attack upon objectives

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which are militarily much more important than such centres—aerodromes, for instance, military depots, lines of communication and supply, naval dockyards and shipyards, as well as such obvious targets for attack as concentrations of troops and warships.

If bombing had been completely prohibited in 1933, and if the prohibition had been made effective, the result, as Major-General A. C. Temperley points out in his book,¹ would have been to prevent an aggressor from delivering a mass attack in the air at zero hour. It would have done so, however, only if the aggressor had not been able secretly to collect the necessary fleet of bombers, or civil aircraft converted for bombing with a view to a sudden attack. Some kind of international supervision or control would have been necessary if this possibility were to be ruled out; without it the position of the too trusting victim of aggression might have been very seriously prejudiced. It is evident from what happened at Geneva that the institution of an effective measure of supervision or control goes beyond the range of practical international politics at present.

It may be that in the future the great Powers will be less indisposed to accept a complete ban upon bombing and the necessary adjunct of arrangements to ensure that the ban does not

¹ *The Whispering Gallery of Europe*, 1938,

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become a dead letter. In that event the hypotheses upon which one has to proceed at present would have to be modified substantially. The kind of emasculated air power that would then be left would be a very different thing from the air power which is the subject of this book.

CHAPTER V

THE LESSONS OF ABYSSINIA, SPAIN AND CHINA

THE Geneva peace talks came and went. Hard on their heels followed wars in three continents. The cynic might suppose that that was the natural reaction from the strain upon the Governments of being on their best behaviour, of being preternaturally good and trying to persuade themselves and others that they all wanted peace, that the old "power politics" were dead, that the reason for arming was not the desire to attack but the fear of being attacked. Alas ! it was not so, or not wholly so. We soon had evidence that, for some nations at least, the impulse towards great armaments was not fear but greed for another nation's territory. The jungle inheritance is not eliminated yet.

What are the lessons to be learned from the fighting in Abyssinia, Spain and China ? They are various, but one general conclusion at any rate can safely be drawn, and it is this : that the air arm has not made the older arms of war obsolete. There are particular lessons to be learned, too, and these are noted in the course of the present chapter.

THE LESSONS OF ABYSSINIA, SPAIN AND CHINA

I. ABYSSINIA

The chief lesson of the war in Abyssinia, some writers have asserted, is one which is ominous for the future—that a war can be won to-day by poison gas sprayed from the air. It has been contended that Italy owed her victories over the Abyssinians to the use of mustard gas by her air arm. This view cannot be sustained.

That gas was used, and on a great scale, there is no doubt whatever. Dr. J. W. S. Macfie¹ makes it clear that a considerable part of the time of his British ambulance unit was taken up with the treatment of patients suffering from the effects of mustard gas. The use of gas was, of course, illegitimate. It could be excused, if at all, only on the plea that it was a retaliation for the mutilation of prisoners by the Abyssinians and the use by the latter of dum-dum bullets. It was not used in the earliest operations. The first use of it, says Mr. G. L. Steer,² occurred on 22nd December, 1935, against Ras Imru's army. Possibly it would not have been used at all if the Italian operations had not been brought to a state of deadlock towards the close of the year 1935.

At first the gas was dropped in drums, and there is some evidence that, so used, it had no considerable effect. "The army rapidly became

¹ *An Ethiopian Diary*, 1936.

² *Cæsar in Abyssinia*, 1936, p. 233.

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accustomed to it," M. Marcel Griaule¹ quotes Ras Kassa as saying. Later, sprays were substituted for the drums and the gas was then much more effective. It was not used in battle, since then it would have endangered friend as well as foe. "Its function," says Mr. G. Martelli,² "was to immobilise the enemy by creating a screen to prevent his advance or retreat." So used, it undoubtedly contributed to the demoralisation of the Abyssinian armies.

Mr. Steer, who followed the war on the Abyssinian side, attaches perhaps a greater importance to the use of gas than does Mr. Herbert Matthews,³ who was with the Italian forces. The former, for instance, attributes the Italians' victory at Lake Ashangi to their spraying the shores of the lake with mustard gas—just as the Californian farmers spray their fruit trees to destroy pests, he says. Mr. Matthews does not deny that gas was used, but he definitely challenges the view that its use won the war.

That aircraft and their explosive bombs and machine-guns contributed materially to the Italians' success is beyond question. "Aircraft," says Mr. Edward Hamilton,⁴ "played a most effective and often a decisive part, especially in the tactical field." Major E. W. Polson Newman⁵

¹ Quoted by G. Martelli, *Italy Against the World*, 1937, p. 233.

² *Italy Against the World*, p. 234.

³ *Eye-witness in Abyssinia*, 1937.

⁴ *The War in Abyssinia*, 1936, p. 140.

⁵ *Italy's Conquest of Abyssinia*, 1937.

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is equally emphatic about the importance of the part which the air arm played. "The moral effect of aviation in this war," said Colonel Konavaloff, a Russian officer who was serving with Ras Kassa,

"was enormous. If the land space was unconquered as yet, the aerial belonged to the Italians. From their heights they penetrated our life, turned it upside down. They could intervene in all our movements. They prevented us from eating and warming ourselves after a heavy march round our camp fires, which we were afraid to light. They turned us into moles who dashed into their burrows at the slightest alarm. Insignificant though the losses which they inflicted on us might be, each Ethiopian thought that he was the special target of the bomb released. All the day under the menace of an enemy who followed us step by step, with something near impunity, since he knew that he was master."¹

The activity of the Italian aircraft, says Herr rischer von Poturzyn,² undoubtedly contributed powerfully to the shortening of the campaign and the curtailment of the casualty list. During the six months for which the war lasted, he states, they dropped nearly 2,000 tons of bombs; on one day alone they dropped 74 tons—that is, the same weight as German aeroplanes dropped in all raids upon Great Britain in the war of 1914-18.

The rôle which the air arm fulfilled throughout the Abyssinian campaign was one ancillary to that of the armies. There was little work of an

¹ Quoted by Martelli, *Italy Against the World*, 1937, p. 269.

² *Luftmacht*, 1938, p. 74.

entirely independent nature. That was natural in the circumstances. The air arm acted at times as a kind of super-cavalry, at times as a supply column gifted with the power of levitation. Its capacity for harrying a beaten foe was demonstrated again and again. After the battle of Enderta it subjected the flying Abyssinians, says Marshal Badoglio,¹ to a "continuous, violent, hammering onslaught which went on without a pause from dawn to sunset [on 16th February, 1936] and was repeated on the next three days, the 17th, 18th and 19th." In this engagement 396 tons of bombs were dropped in all.

Its pursuit was as relentless after the battle of Shire. There, it caught the congested refugees in a narrow passage at the ford of the River Takkaze, "rendering utterly tragic the plight of the fleeing enemy," says Marshal Badoglio,² who attributes no less than 3,000 of the 7,000 casualties suffered by the Abyssinians in this battle to the bombs and machine-guns of the pursuing aircraft. Again, after the final rout at Mai Chio, the air arm pounded the fleeing Abyssinians as they streamed along the shores of Lake Ashangi.

No less notable was the success of the air arm in the service of supply. When the 3rd Italian Army Corps was advancing to the River Gheva after the victory of Enderta, aircraft kept it supplied by dropping food in parachutes, and the

¹ *The War in Abyssinia*, 1937, p. 85.

² *Ibid*, p. 118.

4th Army Corps was supplied in the same way with rations, munitions and water after the battle of Shire. Later, in April, 1936, aircraft dropped as many as twenty-five tons of rations daily for a whole fortnight, while the Eritrean Corps was moving to Dessie.

Yet, when all is said, it was not air power which crushed the Abyssinians. What really broke the power of the Rases was a series of repulses in battles more bloody than those by which we conquered the Sudan nearly forty years earlier. It was "mass of men, mass of fire, mass of artillery, mass of aviation," says Mr. Steer,¹ which overwhelmed the Abyssinians. First, Ras Mulugueta was defeated and killed in the battle of Enderta (Amba Aradam)—the six days' battle which ended on 15th February, 1936 (the pursuit continued until 19th February). Then, on 29th February, the armies of Ras Kassa and Ras Seyum were overwhelmed in the second battle of Tembien (the first, fought on 19th to 23rd January, had been inconclusive). A day or two later the battle of Shire sent Ras Imru and his army streaming back in disorder. Finally, at Mai Chio, north of Lake Ashangi, the Emperor himself was crushed in the battle which began on 31st March and ended on 4th April. Here the Imperial Guard of Abyssinia hurled itself in vain against the Eritrean Army Corps, and the Abyssinian dead lay piled before the machine-

¹ *Cæsar in Abyssinia*, 1936, p. 259.

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guns of the Italians and Askaris as the Baggara warriors had been before the rifles of the British, Egyptian and Sudanese battalions at Omdurman.

The casualties suffered by the Abyssinians in all these engagements were heavy by any standard of comparison. Marshal Badoglio estimates their losses at Enderta at 20,000—as great as those at Omdurman—, at *each* of the two battles of the Tembien at 8,000, at Shire at 7,000, and at Mai Chio at 8,000. The bombs and machine-gun fire of the aircraft helped to swell the total, but the great bulk of the slaughter was done from the ground.

One achievement which stands to the credit of air power in the Abyssinian crisis was accomplished far from the scene of the fighting. That there was such an achievement is even now not commonly understood. It was, in a sense, a victory—a bloodless one—for air power over sea power. The British fleet evacuated the Grand Harbour at Malta in the autumn of 1935 and moved to a new and by no means as convenient a harbourage at Alexandria. Beyond question the chief reason for the move was the fact that Sicily is only 70 miles from Malta—a matter of half an hour's flight for the Savoia 81 or the Caproni 133.

If our relations with Italy had been strained to breaking point, as the result, for instance, of the imposition of an "oil sanction," Malta would have been a decidedly unhealthy place for our

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warships, and it was mere common sense to recognise that fact.

While not mentioning specifically the temporary withdrawal of our fleet from Malta, von Poturzyn¹ calls attention to the general lesson which is to be learned from the Abyssinian war in its wider aspect and of which that incident is a particular illustration. It is that air power has altered geopolitical relationships and has shown itself capable of reversing the advantage which naval concentrations and naval bases formerly bestowed on their possessors. In 1936, he states, a fresh standard, bringing in the third dimension, was set, and we have now to face a new epoch in political and military thought. "The era of air power has begun."

2. SPAIN

In one respect the influence of air power upon the Spanish civil war was vital; without it, there would probably have been no civil war but merely a mutiny, soon quelled. Bombing aircraft helped to transfer the Moroccan troops to Europe in the earliest days of the rebellion, and it was the army of North Africa which, like Lee's army of Northern Virginia, "carried the revolt on its bayonets."

In the war as a whole, air power played a very important, though hardly a decisive, part. It paved the way for the infantry advance, bombed

¹ *Luftmacht*, 1938, pp. 17, 18.

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the rear of the opposing forces and interfered continually with their service of supply and reinforcement. The victories on the Basque front, said General Valle, Under-Secretary for Air, in the Italian Chamber on 16th March, 1938, were chiefly due to the air arm, and the credit for the victory of Teruel he attributed to the same arm to the extent of seventy-five per cent.

In conjunction with the infantry, says Herr von Poturzyn,¹ the air arm had a direct influence upon the issue of the fighting in the Spanish campaigns. Before every infantry advance it attacked the enemy's line with machine-guns and light explosive bombs and paralysed its resistance until the infantry could break through. He quotes General Armengaud as saying that the decisive results of the first assaults were definitely due to the air attacks. It was these which, with artillery, broke the iron ring round Bilbao, and even at Madrid, where the anti-aircraft artillery was efficient and there were strong air forces on each side, the airmen took an immediate part in the ground fighting. In spite of heavy losses, says the General, the air arm proved its usefulness in an engagement, both in the first line and in attacks upon the reserves. It was found also to be the best means of defence against tanks. The events in Spain have shown, says von Poturzyn, that the air arm can con-

¹ *Luftmacht*, 1938, pp. 86-8.

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tribute effectively to strategic and tactical decisions and thus to the general result of a war.

Bombing aircraft of great capacity and of modern types were used on both sides and many cities suffered woefully from their attentions ; yet the moral of their inhabitants was not broken and the war went on. A body of British Members of Parliament, representative of all political parties, who visited Spain in November, 1936, stated in the report which they issued subsequently :—

“ We conclude that the bombardment of non-military objectives was intended to terrorise the civil population, and so break down the resistance of Madrid. Aircraft frequently flew over the city, dropping nothing or dropping pamphlets, with this object. Certain objectives of obvious military importance have, in fact, not been bombed. The attempt to break the moral of the people has been unsuccessful.”

The raids conducted by insurgent aircraft against Barcelona on 17th and 18th March, 1938, were particularly destructive. According to a statement made by the Mayor of Barcelona on 26th March, 875 persons (including 245 women and 118 children) were killed and 1,500 wounded ; 48 buildings were completely destroyed and 75 severely damaged. The bombing was plainly indiscriminate, and the British Prime Minister, Mr. Chamberlain, was expressing the sentiment of the whole civilised world when he spoke in the House of Commons on 18th March of the “ horror and disgust ” which the reports of the raids had aroused. The report showed, he said,

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that the damage had been done largely to living quarters and not to military objectives. The British Government addressed to General Franco a note in the same strong terms of condemnation which the Prime Minister had used in the House of Commons ; the note added that direct and deliberate attacks upon civilian populations are contrary to the principles of international law as based on the established practices of civilised nations, to the laws of humanity and to the dictates of public opinion.

One air raid stands out in strange pre-eminence among the many which marked the progress of the war of ideologies in Spain. It is a useful object-lesson, and the details of the raid are worth recording for their bearing on the future of air bombardment.

Guernica 1

On 26th April, 1937, the small town of Guernica was full of people, for it was market day. At about 4.30 in the afternoon a single German bomber appeared and dropped six heavy bombs. Five minutes later another raider came and this was followed by others, which continued to drop bombs until nearly 7.45 p.m. The attack was carried out by Junker 52 and Heinkel 111 bombers, which unloaded on the town bombs weighing up to 1,000 lb. each as well as 2-lb. incendiary bombs, and by Heinkel fighters, which plunged low over the town to machine-gun the people

who had taken refuge in the fields. "The whole town of 7,000 inhabitants plus 3,000 refugees," said Mr. G. L. Steer, the special correspondent of *The Times* in that journal on 28th April, "was slowly and systematically pounded to pieces." "In the form of its execution and the scale of the destruction which it wrought," he said also, "the raid on Guernica is unparalleled in military history. . . . The object of the bombardment was seemingly the demoralisation of the civil population and the destruction of the cradle of the Basque race."

Other correspondents corroborated Mr. Steer's account. In *The Morning Post* of 28th April, Reuter's correspondent spoke of "the ruthless destruction by insurgent aircraft of Guernica." In the *Daily Express* of 28th April, Mr. Noel Monks, its correspondent in Bilbao, wrote: "I have seen many ghastly sights in Spain in the last six months but none more terrible than the annihilation of the ancient Basque capital of Guernica by Franco's bombing planes." In the *Daily Express* of 29th April, he stated that he and two other accredited correspondents saw coming from Guernica 30 bombers of the heavy Junker 52 type and 15 chasers of the Heinkel 51 type, with 5 Italian chasers. In the same paper on 1st May, Mr. Monks stated: "I will swear to it that Franco's German aviators bombed Guernica and that they killed 1,000 civilians."

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The direct evidence that the destruction was caused by aerial bombardment consisted, said Mr. Steer in *The Times* of 6th May, in the facts that the town and the roofs were a mass of bomb-holes, that trees were snapped off at their stems and their foliage torn by splinters and that bomb splinters and German incendiary bombs were picked up in the town. In his book¹ Mr. Steer gives photographs of the German bombs that were found in the streets. "Gernika," he says,² "was smudged out of that rich landscape, the province of Viscaya, with a heavy fist." The assertion of the Government of Salamanca that the town was destroyed by the "Reds" he dismisses as "the most horrible and inconsistent lying heard by Christian ears since Ananias was carried out feet forward to his long, central-heated home!"³

The suggestion of the Nationalist Government that the Basques themselves burnt Guernica was repudiated in a memorial which the clergy of the Diocese of Vitoria submitted to the Pope in June, 1937, the signatories of which, it was stated, all had "full and absolute certainty of the notorious facts described therein," nine of them being eye-witnesses. The memorial stated as a fact that on 26th April, aircraft in the service of General Franco bombed the venerated town of Guernica,

¹ *The Tree of Gernika*, 1937.

² *Ibid*, p. 238.

³ *Ibid*, p. 246.

reducing almost all the buildings to cinders, and machine-gunned the inhabitants when they fled in terror from the explosions, thus causing hundreds of deaths.

The sensation caused by the news of the destruction was immediate and profound. No event of the Spanish civil war aroused such feelings of alarm and apprehension. It brought home to everyone the reality of war in the air, ruthlessly waged. In *The Morning Post* of 11th June, 1937, Major-General Sir Charles Gwynn, in an article headed "The New Horror from the Air," made the incident the occasion for a proposal that bombing should be completely prohibited. It was indeed a foretaste of greater dangers to come and it had a lesson for this country in particular.

"Bombardments of cities," says Mr. Steer,¹ "have always meant more for the British, who have to defend the greatest and most vulnerable of them, than to any other people. Assuming a German mastery of the air, the destruction of Gernika, with 10,000 inhabitants, by a series of about forty planes in relay, would correspond to the destruction of a borough of 200,000 inhabitants by the size of fleet which Germany might send against Great Britain. The blotting out of Hull, for instance, with a fair number of bombs left over to polish off her shipping. Or the end of Hull."

¹ *The Tree of Gernika*, 1937, p. 258.

Guernica 2

Such is the story of the destruction of Guernica by insurgent aircraft as it was related at the time, and it is beyond question a terrible story—a standing disonour to the German airmen who bombed the town and the Nationalist Government who employed them, if the story is true. There is, however, another version, and it, too, must be placed on record, always with the proviso that it rests mainly on evidence from Spanish Nationalist sources.

One thing at least is certain, that the newspaper correspondents whose reports are quoted above did not arrive on the scene until about 2 a.m. on 27th April. They were at Bilbao when the bombardment took place, and set out for Guernica only when news of the attack came through. When they arrived there, the whole town was in flames. There had, in fact, been a bombardment ; of that there is no question. The inference was naturally that the conflagration was its result.

Yet the bombardment, if we are to accept the report of the technical commission which was appointed by the Nationalist Government and whose report was made in September, 1937, hardly touched the town itself. The number of the killed, whose names are given in an appendix to the report, was not a thousand, but less than a hundred : a number not consistent with a

devastating bombardment. The bombs, said the commission, fell mainly on the network of roadways to the east of Guernica, the object being to cut the communications. What, then, of the "bomb craters" which were undoubtedly seen in the town itself?

There were nine of these and there was something very extraordinary about their location—according, it must be remembered, to the Nationalist commission. They were situated, in each case, close to and at about the same distance from a manhole in the main sewer. A charge of dynamite could easily have been pushed from the manhole along a wire to a point under each of the spots where the explosions occurred, and a fuse laid for detonating the charge at a later time. Further, the effect of the explosions upon the buildings in the town was similar, it was stated, to that of an earthquake shock; it was not the characteristic effect of high explosive dropped from the air. The inference is that the destruction was caused by explosions which originated below the surface, not on impact with it. "To accept the contrary view," says Sir Arnold Wilson in his introduction to the report of the Commission, "is to assume that these, the only 'bomb holes' (so called) in the streets of Guernica, were caused by aerial bombs which, in each of the nine cases, dropped, as the result of nine coincidences, the same distance from the only nine manholes in the streets. The technical

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evidence as to the effects of a subterranean explosion, as compared with those of an explosion caused by the dropping of a bomb from the air, is corroborative."

The fact that houses which were intact on the evening of the 26th April were burnt on 27th and 28th April, and even, it seems, on 29th April, is also recorded by the commission. The commission also stated that the Basque militiamen made no attempt to extinguish the fires on the 26th April and prevented property owners who wished to do so from approaching their homes. But is not the explanation that the militiamen were too tired and dispirited by their long retreat to care what happened to the town?

But what, then, it will be asked, becomes of the statements of the eyewitnesses? The Commission question whether there were in fact any eyewitnesses, stating that the few inhabitants who remained in Guernica took to the shelters at about 4 o'clock and saw nothing until after 7.30 p.m., when the last aeroplane left. During the night explosions were heard at many points in the town, when no aeroplanes were in the vicinity.

Summing up the facts as stated in the report of the Nationalist Commission, Sir Arnold Wilson says :—

" The conclusions to be drawn from the facts summarised under these headings are clear and unmistakable. By far the greater part of the destruction worked in Guernica was the deliberate work of the retreating forces, and that part,

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if any, which was the result of the air raid of the 26th could have been localised and, in so far as the fires were concerned, substantially mitigated by prompt action on the evening of the 26th."

To this conclusion it seems to the present writer to be unsafe as yet to subscribe in any confidence. At the same time it seems to him that there may be some measure of truth—how much one cannot say—in the second version of the facts, regard being had to a previous historical incident to which it is strange that no reference has been made in the controversy about Guernica. The incident referred to was as widely discussed in its own day as Guernica has been in ours, and there was no lack of hard swearing on both sides, then as now.

On 11th July, 1882, Admiral Sir Beauchamp Seymour's fleet bombarded Alexandria. On the same date, in the evening, and during the night of 11th to 12th July, a considerable portion of the town was destroyed by fire. The fire was attributed at the time to the bombardment, but this was denied by the Admiral and by the Prime Minister, Mr. Gladstone, in the House of Commons. It is indeed entirely beyond question that the real cause was incendiarism on the part of Arabi Pasha's troops who evacuated the town during the night. It is true that a few small fires were started by the bombardment, but they were extinguished before evening and had no connection with the great conflagration which

began many hours later and at a number of different points.

As at Alexandria so at Guernica bombardment and arson may each have contributed to the damage, but whether the major part was due to the same cause in each instance is open to question. In either event the incident has its lesson for us.

The lesson, if the destruction was due to the bombing, is that of the terrible destructiveness of modern aircraft where the place attacked is utterly defenceless. If it was due to deliberate incendiarism the lesson is no less memorable. It is that the effects of a bombardment may be "faked" by the victims for the purpose of propaganda. One is not entitled to affirm that that did happen at Guernica ; but it *may* have happened—or the first story may be true after all ; one simply cannot say. The fate of Guernica is ominous for the future, whatever be the truth of the tragic affair.

Granollers.

Whatever be the truth about Guernica, there can be no reasonable doubt about the bombing of Granollers, a Catalan town of 10,000 inhabitants, by the Nationalists on 31st May, 1938. About 200 persons were killed and 500 injured, most of them being women and children. In Granollers itself, according to the report of Mr. J. H. Leche, the British Minister at Barcelona, who visited

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the town after the bombing, there were no military objectives whatever, though there were two or three factories on the outskirts and an aerodrome farther off. The bombing of the centre of the town, in which over 100 women and children were killed, was clearly not justified.

As a result of this and other raids, the Under-Secretary for Foreign Affairs announced in the House of Commons on 3rd June, 1938, that the Government were considering "asking certain foreign Governments who were in no way identified with either of the contending parties in Spain to join with them in setting up a small independent commission which could hold itself in readiness to proceed to the scene of any aerial bombardment at the request of the party suffering attack, to report the damage done and indicate in their view any possible military objectives which were in the neighbourhood. The commission would immediately publish its report and world opinion would be able to judge with the knowledge that the matter had been impartially investigated whether there was any justification for these barbarous methods of warfare."

The neutral Governments who were approached were Sweden, Norway and the United States. For a time it was hoped that the first two, with possibly the Netherlands instead of the United States (which declined to participate), would join in the proposed inquiry. Eventually, however, Mr. Chamberlain announced in the House of

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Commons on 13th July, 1938, it was found impossible to form the commission on an international basis and it was therefore proposed to dispatch one consisting of two British subjects only.

The experiment, if developed, may have an important bearing upon air bombing in a future war, but an international agreement as to what a military objective is is required to make it really useful.

3. CHINA

In China as in Spain we have seen great armies on the march and in action, to remind us that the old order is not dead and gone. In China, too, as in Spain, we have seen terrible manifestations of the destructiveness of bombardments from the air, cities grievously damaged, men, women and children slain and mutilated. Yet—again—the war has continued and the will to resist has not been broken. Terrorisation as a policy has been proved to be a failure.

Nanking was raided about a hundred times before it was captured by the Japanese. On some days there were as many as four separate raids. Fortunately the city was well provided with dug-outs and shelters. Some were very costly and elaborate constructions of steel and concrete, fitted with heating and electric light and costing in some instances nearly £16,000. Each of the embassies at Nanking had its own dug-out, proof

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against anything short of a direct hit. Frequently, however, said *The Times* correspondent on the Yangtse in that journal on 11th February, 1938, no use was made of the dug-outs when a raid occurred. The people for whose protection they were intended were either pursuing their vocations or watching the bombing from some vantage point.

Severe though the casualties at Nanking were, they were less, said the same correspondent, than might have been expected, and they failed to cause any panic among the populace. The Chinese adapted themselves stoically to the sufferings which they had to endure. "A wretched cigarette pedlar bleeding to death in the street amid his scattered wares, moaning but not complaining, remains in the memory as typical of a patient, industrious people visited with the horrors of modern warfare when all they want is to be left alone."

A hopeful incident of the war was the neutral nations' strongly-expressed condemnation of indiscriminate bombing in China and the effect which that verdict had for a time at least upon Japan's policy. In September, 1937, the British, United States and French Governments made representations at Tokyo against the bombing of civilian districts in Nanking, Canton and Hankow. The British note protested against the bombing of other than military objectives, and the French protest was in similar terms. The American note

stated that the general bombing of an extensive area in which resided a large population engaged in peaceful pursuits was "unwarranted and contrary to the principles of law and humanity."

Japan denied that her airmen had in fact attacked non-combatants directly and pointed out that the military aerodromes and establishments in and around Nanking which they did attack were legitimate objectives. A statement made by a representative of the Foreign Office at Tokyo on 24th September, 1937, gave some indication, however, that the Japanese authorities were inclined to take the objections to heart. This statement was to the effect that fresh and strict orders had been sent to the military commanders in China, enjoining them to safeguard the lives and property of non-combatants, especially those of neutral countries.

The protests made by the individual Powers were supplemented by the condemnation embodied in the resolution which was passed by the Far Eastern Advisory Committee of the League of Nations on 27th September, 1937. The Committee, upon which twenty-three States were represented, expressed its profound distress at the loss of life caused to innocent civilians, including great numbers of women and children, as the result of the bombardment of open towns in China by Japanese aircraft, and declared that such acts "have aroused horror and indignation throughout the world."

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The immediate effect at any rate was a salutary one. In *The Times* of 1st October, 1937, there appeared a message from the correspondent of that journal in Tokyo, dated 30th September, containing the following relevant passage :—

“ It can well be said that Japanese operations will not again be on the unrestricted scale of September 22nd. This statement is confirmed by the fact that since that date Nanking has not again suffered a general bombardment. The Foreign Office now publishes a daily account of Japanese air raids. The list for September 28th, issued to-day, records raids on seven different places in addition to Shanghai. The targets were: six aerodromes, one railway station, one military train, one munition factory, and one Army warehouse.”

“ Accounts of foreign criticisms,” the correspondent went on, “ continue to be published in the Japanese Press. They provoke embittered retorts; but it would be easy for the authorities to prevent their appearing at all, and their publication is a means of showing the people who can influence policy that even a threat of aerial frightfulness turns foreign opinion against Japan.”

If one of the lessons learnt by the world from the war in China is that a belligerent in the handling of air power cannot afford to disregard the humanitarian feelings of neutral nations, at least one valuable result will have been produced by the tragic events in that country. A usage of air bombardment is in process of formation and among the factors in its development may be the condemnation by the civilised world of Japan's acts, transitory though the effect proved to be. The fact that civilians suffered severely in some later bombardments, for instance, that conducted

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against Canton on 17th April, 1938, unfortunately makes it doubtful whether indeed the change of heart induced by the September protests was a lasting one.

Canton suffered severely again in the series of raids which began on 28th May, 1938, and continued throughout the week. The number of killed and wounded among the civil population ran into thousands. The Wongsha and Taishatou railway stations, the industrial centres on Honam island, the Pearl River bridge, the Government buildings in the Central Park, the power station, waterworks, and factories in the Saikwan area were the apparent targets of attack. Much damage was done, however, in districts in which there were no military objectives. It was excused by the Japanese Foreign Office on the ground that it was mainly due to "the aimless firing of the Chinese anti-aircraft guns, which caused shrapnel to fall in all parts of the city." That our Government were not inclined to agree with this explanation was evident from the announcement of the Under-Secretary of State for Foreign Affairs in the House of Commons on 3rd June, 1938, that "instructions have been sent to His Majesty's Ambassador at Tokyo to protest urgently against this indiscriminate bombing of civilian areas and thickly-populated areas." The protest had little effect. Raids on Canton continued notably on 12th and 14th July; after the latter the water front was described as "a shambles."

CHAPTER VI

FLIGHTS OF FANCY, AND THE FACTS

SINCE that bewildered hero, Bert Smallways, was carried aloft involuntarily for the series of adventures described in Mr. H. G. Wells's *War in the Air*, a number of novelists have tried their hands on the same subject. It is doubtful whether any of Mr. Wells's successors in the thirty years since he wrote have improved upon him. Certainly his descriptions could not be bettered. "They came down upon the Germans on the wings of a great gale in the twilight, amidst thunder and rain." Could anything be finer as a description of one great air flotilla engaging another in the dusk?

Especially since the war have writers of fiction tried to harrow our feelings with visions of the apocalyptic wrath to come. Playwrights, too, have let their fancy run riot among the horrors which are in store for mankind. They have foretold holocausts, massacres, wholesale devastation, death and damnation rained from the skies. The more the horror is piled on, the better, apparently, readers and audiences are pleased.

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Gas is usually the agency of destruction. Sometimes it is gas of a terrible potency, as in the Earl of Halsbury's *1944*. Occasionally it is of a milder quality as in Mr. Rowland James's *While England Slept*, which pictures all England gently deprived of memory, and thus made more receptive of a new religion, by the fumes sprayed from the air. Usually, however, the gas is horribly lethal.

In *The Gas War of 1940*, by "Miles," phosgon gas is the cause of fifteen thousand million deaths in a week. The author of this book also calls to aid a new invention, "Aerolium," an alloy stronger than steel but lighter than paper—the dream of the metallurgical engineer. Devices as strange are imagined by Mr. Michael Arlen in *Man's Mortality*: "motive air," for propelling aircraft, scythes for cutting through the enemy aircraft, rays which, directed at the latter, make their steel so soft that the scythes cleave them like butter. For Mr. Harold Nicholson, in his *Public Faces*, the *diabolus ex machina* is the "Livingstone alloy" which has the two-fold characteristic that it enables the explosive chamber of an aero-engine to resist unlimited charges of any of the fulminites and that it produces atomic bombs so powerful that a single one could destroy New York.

Such forecasts are not, of course, to be taken too seriously. Death-rays and the like may indeed come to confound all our calculations, but they

lie outside the scope of the enquiry attempted in this book. It is idle, again, though interesting, to imagine such a special situation as that around which Air Commodore Charlton builds the plot of his *War over England*—a book which, being fiction, is to be distinguished from his other works referred to in Chapter III. In this book he imagines a sudden attack upon the Royal Air Force assembled for the annual display at Hendon. Since he wrote it has been decided to hold no further displays at Hendon; but substitute a score of displays on Empire Air Day and a score of raids, and the conditions which Air Commodore Charlton postulated are substantially fulfilled. His suggestion is that the unexpected attack may paralyse our whole fighting strength in the air, alike in *personnel* and in *matériel*, and that the enemy may thereupon proceed at his good pleasure to destroy the Lots Road Power Station, the docks in London and elsewhere, and hundreds of other objectives. Incendiary bombs which produce inextinguishable fires are the special instruments of destruction.

The books above referred to are mentioned here only because they are representative of a large body of literature—and indeed of popular opinion—on the subject of the character of the next war, painting that character in the blackest of colours, and making two assumptions which are of particular interest for the present writer's purpose. They assume in the first place that it

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will be waged, very gruesomely, by air forces alone and that armies and fleets will play no effective part in it. They assume in the second place that the enemy will have at his disposal a practically unlimited supply of aircraft and air personnel.

In the next chapter the writer gives reasons for the belief that a future war is unlikely to be purely a matter for the air arm. Here, as books have been quoted, it is sufficient to refer to another book of a different order and one which gives a more sober estimate of the probabilities. This is *What Would be the Character of a New War?* which was issued under the auspices of the International Parliamentary Union in 1931. It is composed of a number of papers contributed by specialists, and that dealing with "Aerial Warfare" is contributed by two Swedish officers, Major K. A. Bratt and 1st Lieutenant G. B. R. Sergel. They are guarded in their forecast. The manner in which the air arm will be used and its influence will depend, they think, upon the circumstances of the particular war. It may be used against the enemy's military forces, or against his vital centres, or against both. Comparative strength in the air will be an important factor, and the belligerent who is the stronger in that element will exploit his advantage to the full. "It is impossible," say the authors, after examining the possible variations, "to predict

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which of the above roughly sketched forms a future war would take.”¹

That, indeed, is the only conclusion to be reached in any sober survey of the question. One cannot tell what exactly the nature of the next war is going to be. It follows that one cannot affirm confidently that it will be decided by air action and by that alone.

A study of the kind mentioned above serves also to correct the impression left by the more popular kind of forecast, that every nook and cranny of a belligerent's territory is likely to be raked with bombs in the next war. That, frankly, is impossible. Yet, quite apart from what one may read in the pages of the prophetic novelists and in the sensational Press, one might think from much that one sees around one nowadays that the whole country, north, south, east and west, is going to be swept with the besom of destruction.

Publicity for air raid precautions has been successful in so far as it has undoubtedly made most of the people of this country air-raid-conscious. It is a question whether it has not been too effective, from one point of view.

A new disease, financial “jitters,” has been prevalent on the Stock Exchange, one knows, of late. There is another new malady which is equally noticeable: air raid jitters. One finds it here and there. When the Germans forcibly absorbed Austria in March, 1938, the present

¹ *Op. cit.*, p. 94.

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writer, conceived (entirely wrongly) as the depository of secret information, was asked by more than one person in his particular outer suburb whether it was true that Hitler would be sending over his bombers to attack us in the next week or so. Not only the outer suburbanite but the remote villager is sometimes sure that he is likely to be the special target for the enemy's bombs in the next war.

The man who lamented that he was the greatest sinner alive was snubbed, we know, by his guardian angel: "Vanity, my little man, you're nothing of the kind!" One is inclined to answer the suburbanite or villager similarly.

In a letter to *The Times* of 18th April, 1938, headed "Are We Downhearted?" Sir Ernest Benn wrote:—"The mysteries of propaganda both at home and abroad have yet to be unravelled, but I wonder whether in our splendid enthusiasm for A.R.P. we are not inclined to emphasise the element of fear?" He recalled some incidents of the Great War to show that we were not then troubled with fear, and he ended:—

"All wisdom dictates that we should adopt every precaution against the terrors of the air, but truth demands that in doing so we should not allow the foreigner to imagine that we are afraid. We have not yet lost all those qualities summed up in the slogan 'Are we downhearted?'"

The fear of air attack to which Sir Ernest Benn refers as an element of A.R.P. propaganda

is natural and salutary within limits. Spread throughout the whole country it is in itself a potential danger. In so far as its basis is the idea that an enemy will have an inexhaustible supply of bombers and of bombs to raid every nook and cranny throughout the country it is entirely unwarranted. Some excuse for such an idea, it must be confessed, has been given by the forecast of certain of the experts. In Chapter III the writer has quoted some rather unguarded prophecies of this kind.

One finds, for instance, suggestions of the extension of air attack in a future war to "the farms . . . and the places where people carry on their daily lives"; of "entire regions inhabited by peaceful inhabitants . . . threatened with extinction"; of destruction spread through "towns and villages, perhaps far from the field of battle, where live and work the civil population"; of "the extermination of the civilian population."

Now, where are the aircraft that would be needed for this wholesale devastation to come from? From the colossal programmes of construction which are now in hand in all the great States, it will perhaps be said. That answer would be based on a complete misapprehension. The programmes are not colossal, and they will not give the numbers of machines required if the forecasts of universal destruction are to be realised.

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It is difficult to arrive at the exact numbers of aircraft which are being produced in this and other countries at present. Mr. Churchill stated in the House of Commons on 7th March, 1938, that Germany was producing twice as many as we were. In the debate on 12th May, Mr. Attlee stated that the production of German aeroplanes was nearly double that of British. What our rate of production was neither speaker ventured to assess. On 15th March, 1938, replying to the debate on the Air Estimates, Sir Thomas Inskip, referring to the complaint that our production of airframes was well under 100 a month (engines are always ahead of airframes), stated that "he could assure the House that it was a very different figure from that." In the *Empire Review* for April, 1938, Lieut.-Colonel Moore-Brabazon, M.P., said that our output of machines had reached 200 a month and would rise to 300 when the shadow factories were in production. Germany, he stated, was producing 350 machines a month and could produce 600 on a three-shift basis. In the Budget debate on 28th April, Mr. Boothby placed German production at 500 machines a month and 600 in the near future. He doubted whether our figure was half the present German figure. Other estimates of our production in April, 1938, were 1,500 to 1,700 aeroplanes a year, which, allowing for a rising graph, would point to an average of considerably less than 150 a month in the year then just ended.

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These figures relate to the programme of construction under Scheme F, which aimed at a metropolitan air force of 1,750 first line machines. That scheme was replaced by Scheme L, which, it was announced in Parliament on 12th May, 1938, aims at a metropolitan first line strength of 2,370, to be completed within two years, with first line strengths of 490 overseas and not less than 500 in the naval air service: a total of 3,360 first line machines. The production programme, it was announced, would be accelerated, the output being increased by 50 per cent. in the financial year 1938-39 and doubled (in comparison with that year's output) in 1939-40. This was the rate of increase as stated by Lord Swinton in the House of Lords; in the House of Commons, also on 12th May, Lord Winterton stated that in 1939-40 the output would be increased to "fully three times its present size."

In the resumed debate on 25th May, Dr. Dalton, leading for the Opposition, suggested that "our production was only 200 to 300 a month, which might be accelerated by independent service." The highest rate attained in 1937-38 was probably not more than 200 a month, and if the references to a 50 per cent. increase relate to the output in March, 1938, or thereabouts, it seems that the output in 1938-39 may be 300 a month and in 1939-40 as much as 600 a month. The fact that Lord Nuffield is to build air frames, while factories are being organised also in Canada,

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points to the possibility of some such rate of production. The rate may indeed be improved upon if Scheme L is replaced by a more ambitious one still. The country will probably be content with no rate of production which is less than Germany's.

The difficulty is to arrive at Germany's production. The Marquess of Lothian stated in the debate of 12th May, that in 1939 Germany would not have less than 8,000 first line machines and a total of 12,000 to 15,000 machines in all. Sir Hugh Seely stated in the Commons on the same date that Germany had "to-day" 3,500 first line machines and would have 6,000 within a year. Dr. Dalton suggested in the debate on 25th May, that Germany had anything between 750 and 1,200 more first line aircraft than we had, and that she was steadily forging ahead of this country. For a first line strength of 6,000 to 8,000 machines an output considerably in excess of 600 machines a month would be necessary, but it is difficult to believe that Germany could have a production capacity very greatly in excess of that rate.

A monthly production of 600 to 700 aeroplanes looks impressive. Actually, as compared with the production in the last year of the Great War, it is relatively modest. In the ten months, January to October, 1918, we manufactured nearly 27,000 aeroplanes and nearly 30,000 engines, and before the armistice our rate of output had risen to 3,500

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aeroplanes and 4,000 engines a month. This production was the basis of a first line strength of 3,300 machines. The ratio of monthly output to first line establishment appears to be high but actually is not very abnormal, allowance being made for the rising graph in the ten months.

In *The War in the Air*¹ Mr. H. A. Jones quotes a memorandum which Sir William (now Lord) Weir prepared in 1917, and which showed that to maintain 100 squadrons of 18 aeroplanes each in the line a monthly production of 1,000 aeroplanes, *plus* half as much again for home defence and training, was necessary. In other words, to maintain 1,800 aircraft at the front 1,500 had to be produced each month. A French calculation of the same year estimated a monthly output of 2,400 airframes and 4,000 engines as the basis for a strength of 4,000 aircraft at the front.

It may be noted that Herr von Poturzyn,² writing before Scheme L was adopted, foretells that Britain and France will each have a first line strength of 3,300 machines in 1940: the same strength as we had in November, 1918, and only slightly less than the French first line strength at that time (3,600). Our reserves, it may be added, were much greater than the French. Herr von Poturzyn is discreetly silent as to Germany's future strength.

Now, it is well known that our effectives in

¹ *The War in the Air*, VI, p. 93.

² *Luftmacht*, 1938, p. 22.

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1918 were not sufficient to allow raiding of the interior of Germany to be conducted upon any considerable scale. There is no reason to suppose that a first line strength of 3,300 to 3,500 machines will enable us to do very much more in 1940 or after. Germany, too, was unable to carry out much long-distance or (so-called) strategic bombing in 1918, when she had a first line strength of 3,000 machines. Her output at the end of war was about 2,000 machines a month; in 1918 she produced 14,356 aeroplanes and 16,412 engines—not much more than half our output. Clearly, her present output, even if it is 600 or something more each month, will be insufficient to provide a first line strength of such dimensions that the prophecies of universal devastation are likely to be fulfilled.

As long ago as 1924, Admiral Sir Reginald Custance¹ questioned the likelihood of any considerable detachment of “the aery” being available for secondary services when the requirements of the armies and fleets were met.

In 1926 W. C. Sherman² pointed out that it would be impossible to attack *every* factory in an enemy country engaged in munition work. The number, he stated, would be far too great and all that could be attempted would be the bombardment of key plants, with the object of crippling the munition industry as a whole. It is obvious

¹ *A Study of War*, 1924, p. 92.

² *Air Warfare*, 1926, p. 218.

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that the idea of an enemy's being able to bomb every town and village throughout this country is simply fantastic. Even all the military objectives could not be attacked.

Major Langeron of the French air service, says Herr von Poturzyn,¹ has worked out in detail the number of *objectives of military importance* within the (more or less) square figure of which Liverpool, Königsberg, Bucharest and Bordeaux are the points. He makes the total 25,000. Of these 10,000 are within the boundaries of France and her probable allies, 15,000 in countries with which she might be at war. He allows a load of from one to three and a half tons of bombs for each bomber according as the distance to be travelled, out and home, varies inversely from 200 to 1,000 kilometres. He assumes that ten tons of bombs would be required for the destruction of each 500 square metres of the objective attacked.

On these assumptions he calculates that the French air force in 1938 would be able to keep up a sustained bombing attack on just over 1,000 objectives, the total bomb load required being 2,500 tons. If *all* the objectives within range were to be bombed, France would require an air force of 10,000 bombers, each of 1,500 horse power, and the personnel necessary for the handling and maintenance of this force would be 20,000 pilots, 80,000 to 150,000 mechanics, and 250,000 factory workers. Such a force and

¹ *Luftmacht*, 1938, p. 60.

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such an organisation for upkeep are beyond anything yet conceived as practicable by the air administration of any country. If, in addition to military objectives, civil objectives such as small towns, outlying suburbs and villages, not to mention farms, were to be included in the calculation, the figures would become almost astronomical.

But, it may be objected, the argument used in this chapter is relevant only to a continuing war, in which enormous replacements—possibly 80 per cent. each month—will be necessary on account of losses of all kinds. At the outbreak of a future war the hostile air force will be free to strike where it likes and at full strength, without regard to the distracting claims of the other services. That is true, but it does not follow in the least that the air force will be able to deluge a whole country with bombs. There will be far more important targets for its attack than villages and farms. The prime object will be to interrupt and disorganise the other belligerent's mobilisation and the concentration, perhaps the embarkation, of his forces. If an air force is to attempt these tasks effectively it is unlikely to have any great margin of strength available for other and less vital expeditions.

It may also be contended that the experience of 1914-18 is no true guide to the future, since conditions will be fundamentally changed. Then, great defensive lines lay stretched across Europe,

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huge armies were engaged and many separate theatres of war were simultaneously open. In the next war armies will be smaller, they will be more mobile and the campaign may be confined to a single front. Even in these circumstances, however, the claims upon the belligerents' air arms for work ancillary or helpful to the ground fighting may be even greater than in the late war. Events in Abyssinia and Spain have shown how important a rôle air forces can play in pre-battle, battle, and pursuit. They are likely to be needed more than ever for work of this kind. Of course, if there were no ground fighting this argument would lose its validity ; but a war without surface encounter is improbable in the extreme.

Another possible contention is that what is to be feared is not the deliberate bombing of little, lost villages or outlying suburbs, but mistakes by enemy airmen in a countryside which will be completely darkened, or possibly the haphazard jettisoning of bombs when an aircraft's load has to be lightened, to enable it to reach home or for some other reason. The odds against such error or mischance in any individual case are, however, enormous. In any event, the danger hardly extends to the areas in which enemy aircraft are unlikely to be seen. After all, as "The Old Stager" in *The Sphere* observed in a very sensible note in that journal on 14th May, 1938, the chances of being killed by a German bomb are less than of being killed by an English

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motor-car, and Slocum Parva might well be left, he suggested, outside the scheme of air raid precautions. "Not even Germany can cover every acre of England with bombs in a month."

It is not implied for a moment in anything that is written here that all the air raid precautions are unnecessary and a waste of time. They certainly are not. What is suggested is that we are inclined to be indiscriminating in our organising of the protective measures, and that, as a result, there is some danger of the inoculation of the nation as a whole with a germ of defeatism which might become dangerously active in the day of trial. The problem of dealing with the air menace is largely a problem of psychology, and brooding over it unnecessarily is a bad preparation for the test of nerves which its actual impact will bring.

There is unquestionably vital and urgent work to be done in preparation for that day—the protection of our great London hospitals, for instance, with their thousands of helpless inmates. That kind of work should be given priority and relatively unimportant tasks should be set aside for the time. If we have left undone things which we ought to have done in the Whitechapel Road, it will be poor consolation to feel that we have done things which need not have been done—which might have been left to Providence—in the diocese of Exeter. The really important work of protecting the vulnerable areas will be accomplished the more surely and effectively if we do

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not trouble too much about safeguarding a thousand parish pumps.

Of course, parish pumps are symbolic of votes, and that can never be forgotten by a Government which is a Government only by the grace of a majority of parish pumps. A Government which asks for sacrifices in the cause of rearmament must convince the voters that there is a danger to be met, and the voters who have to pay the extra 6d. on their income tax and the extra 2d. on their pound of tea are not merely the dwellers in the districts that are really likely to be bombed. The menace has to be brought home to all, and this can best be done if people everywhere see signs of the preparations to meet it at their own door-steps. It would be a pity if the result were the dissipation of energies which ought to be concentrated on making the really vulnerable areas as secure as possible : which they certainly are not as yet.

CHAPTER VII

AIR POWER IN ACTION : STAGE ONE

SINCE 1934, air power has been in action, though not in the field, in so far as the war of the workshops has begun and is still going on.

In 1934 Germany began seriously to rearm in the air. By the middle of that year she had made substantial progress. On 30th July, 1934, Mr. Churchill warned the House of Commons that "Germany has already in violation of the treaty [of Versailles] created a military air force which is now nearly two-thirds of our present home defence air force." By the late autumn she had increased the number of her military aircraft very considerably. On 28th November, 1934, Mr. Churchill, who played the ungrateful but, as it proved, necessary rôle of Cassandra throughout this dramatic episode, stated in the House that her air force was rapidly approaching equality with our own. In a year's time, he said, she would be at least as strong as Britain and by the end of 1936 nearly twice as strong.

Mr. Baldwin, the Prime Minister, stated in reply that Germany was a "dark continent," and it was very difficult to ascertain what was

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going on there ; but it was correct to say that she was recreating an air force. He could not guarantee the German figures, but he estimated that she had between 600 and 1,000 military aircraft ; the French estimate of her strength was 1,100. Our own strength at home and overseas was then 880 machines, excluding the non-regular formations. Our strength at home, including the non-regular formations, was 690 aircraft. These were first line aircraft, backed by a far larger number of reserve and training machines. The German figures which he quoted were *total* numbers, not first line, and, he said : "It is not the case that Germany is rapidly approaching equality with us." "Her strength is not fifty per cent. of our strength in Europe to-day."

Finally, he made this important pronouncement : "His Majesty's Government are determined in no conditions to accept any position of inferiority with regard to what air force may be raised in Germany in the future."

His words made it clear where the danger point in Europe lay. For years we had been inferior in air strength to three or four other countries. In the early months of 1934 our nearest neighbour, France, had 1,650 first line aircraft as compared with our 850. We did not feel particularly alarmed. It was a very different matter when Germany gave signs of approaching equality with us, or surpassing us.

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It is difficult to read Mr. Baldwin's statement, quoted above, as anything other than a reference to actual strength in aircraft, whether first line or total. The statement followed upon references to comparative strengths measured by numbers of machines, and nothing was said on that occasion to indicate that any other standard of comparison was in question.

In the debate on Air Force expansion in the House of Lords on 12th May, 1938, Lord Swinton said that :

“ he was not sure that even Lord Baldwin ever used the word ‘ parity.’ It was a bad term. What the Government had to be satisfied with was that in reply to an attack by a potential aggressor there was the active defence, fighter, anti-aircraft defence, which would be sufficient to meet that attack—and the size of it must be conditioned objectively by the size of the force which might be brought against it—and, secondly, there was the counter offensive force. It would always remain absolutely necessary to have a strong counter offensive force.”

He added that he would prefer the formula “ wholly adequate for our necessities ” to the term “ parity.”

It is true that Mr. Baldwin did not use the word “ parity ” and, further, that Lord Swinton's formula is an improvement upon the latter term. There is, however, no shadow of doubt that what Mr. Baldwin was generally understood to have pledged his Government to was parity in numbers of aircraft.

The expression “ first line aircraft ” is used in

this and the preceding chapters, and it is well to be clear as to its meaning, which is frequently misunderstood. The term is used sometimes as if it referred to the quality of the aircraft in question, as if, in fact, "first line" meant in relation to military aircraft more or less what "A.I. at Lloyd's" means in relation to shipping. It means nothing of the kind ; nor does it mean simply "serviceable." It was in the latter sense that Lord Mottistone used it in the House of Lords, apparently, on 23rd May, 1938, when he said that "if the war had gone on through 1919 we should certainly have had 40,000 first line aeroplanes." We might have had 40,000 serviceable machines ; by no possibility could we have had 40,000 first line, in the true sense. "First line" machines are simply aircraft on squadron establishment. The number of aircraft on a squadron's establishment varies from 4 to 18 according to the type of squadron concerned—flying boat, heavy bomber, light bomber, army co-operation or fighter squadron. The first line aircraft are those which the squadron has in use ; it is assumed always to have in use the full number of machines laid down in the establishment. Behind these there is the immediate reserve of machines of exactly the same kind as those in use and fit to replace them in the event of a casualty ; and behind these again are the workshop and stored reserves. Our first line strength is only a part, and not the major part, of the total strength

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in bombing, fighting, reconnaissance and other operational machines possessed by the Royal Air Force. In addition to these operational machines there are all the training machines, which are never reckoned in first line strength. Since reserves and training machines are an essential part of a country's air strength, the first line yardstick is not a wholly satisfactory measure. It is, however, a convenient one, and it has the merit, in the expert's eyes, of mystifying the layman.

In the spring of 1935 a new development came to pass. Sir John Simon, the Secretary of State for Foreign Affairs, replying on 3rd April to a question in the House in regard to his recent conversations with Herr Hitler, stated :—

“ The German Chancellor stated in general terms that Germany had reached parity with Great Britain in the air.”

Explaining this statement in the House on 2nd May, 1935, he stated that he had since been informed that it was intended to imply that Germany's first line strength was equivalent to a British first line strength of some 800 or 850 aircraft. Mr. Churchill declared roundly in the same debate that “ both in numbers and in quality Germany has already obtained a marked superiority over our home defence Air Force.”

The new disclosure led to an immediate reconsideration of our programme of air rearmament. In July, 1934, it had been announced that the strength of the home defence air force

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would be raised to 75 squadrons. On 22nd May, 1935, it was announced that the metropolitan air force would be raised to 123 squadrons, comprising 1,500 first line machines ; the metropolitan air force was that part of our total air force which would be available for the defence of Great Britain, including the non-regular squadrons but excluding the units of the Fleet Air Arm as well as all units overseas. The new and expanded programme was to be completed by 31st March, 1937. It was in fact completed by the middle of 1937. By that time the 123 squadrons promised had been formed, though some of them were not yet at full strength ; 68 of them were bomber and 30 fighter squadrons.

Receipt of information regarding further increases in Germany's air strength led to increases in our programme also, until in 1936 a strength of 1,750 first line aircraft for the metropolitan defence force became the aim, to be attained in 1939.

On 12th May, 1938, however, it was announced in both Houses of Parliament that the programme referred to above had been reconsidered and replaced by one providing for a first line strength of 2,370 aircraft, to be reached within two years, together with 490 first line machines overseas and not less than 500 in the naval air branch. It is not unlikely that this programme will again have to be increased. It is a flexible programme, said Mr. Chamberlain in the resumed debate on

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25th May, and must vary from time to time with the international situation. The Government, he said, would try to get the maximum execution possible in the next two years.

Not only was a scale of air rearmament far surpassing anything hitherto contemplated in peace time thus embarked upon, but a new and most significant method of executing the programme was adopted. The method of *war production* was brought into operation. The "shadow factory" scheme, which was intended to be put into force whenever war should come, was resorted to as the best means of achieving the results desired. This scheme provided for the allocation of a number of industrial factories to the three Services for the production of armaments in time of war, some of the great motor-car works being allotted to aircraft manufacture.

"We decided," said Mr. Baldwin in the House of Commons on 12th November, 1936, "that the execution of the 1939 programme afforded an admirable opportunity of giving these firms an experience in producing aero engines with the minimum interference with their civil business."

Five large motor manufacturing firms—Messrs. Austin, Rover, Daimler, Humber (Rootes) and Standard—undertook the production of engines for aircraft, each being responsible for certain parts of the Bristol Mercury air-cooled radial engine—an engine used in various types of Royal Air Force machines. In addition, the manufacture of Battle

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and Blenheim airframes was undertaken by Messrs. Austin and Rootes respectively.

In intention, at any rate, everything was sacrificed to speed of production. On no other grounds can one explain the amazing decision to bunch all the shadow factories in two towns, Coventry and Birmingham, and, incidentally, to place the seventeen acres of the Austin factory under a single roof. The official explanation that the shadow factory was necessarily located in each case in close proximity to the parent firm was not in the least convincing to anyone who appreciated the wider issues involved. Attention was called in the House of Commons to the folly of what we were doing in this respect by Mr. Richard Acland on 6th November, 1936, and by Mr. Oliver Simmonds on 16th November, 1937. The only shadow factory not in the two Warwickshire towns was the Rootes airframe factory, which was first to have been built at Maidenhead, but eventually, as the result of an agitation in Parliament and the Press, was located on the decidedly safer site of Speke aerodrome, in Lancashire.

Whether or not one agrees with Captain Norman Macmillan's view¹ that our factories ought to be in Canada, one cannot but admit the force of his contention that "the erection of shadow factories in the United Kingdom situated within the vulnerable bombing zone is based upon a restricted

¹ *The Chosen Instrument*, 1938.

vision of the possibilities—one might say the certainties of the strategic values of air war.”¹

The adoption of the shadow factory scheme in 1936 was a remarkable innovation. What it amounted to was the inauguration of a procedure of making war by stages—the production stage first, then the fighting stage. The fact that a stage in a war was in progress was emphasised when in April, 1938, the Chancellor of the Exchequer announced the raising of the income tax to a rate of 5s. 6d. in the pound—a rate higher than any ever imposed in this country except during the late war and its immediate aftermath. A war economy could alone justify such a burden on the taxpayer. But the bringing of the shadow factory scheme into force was the most significant pointer to a new order.

A system devised for war was taken out of cold storage, in which it had been kept in readiness for the next great war, and brought into use before the “zero hour” for the guns. The technique of the Great War was improved upon and brought up to date. Then, war production began only with the fighting. Now we are wiser in our generation. We begin the production stage betimes, thus escaping for a while at least such inconveniences and distractions as air raids, shortage of materials and man power, etc.

Concurrently with the adoption of this system of intensive production of the instruments of

¹ *Ibid*, p. 164.

active air defence, the organisation both of ground defences and of the means of passive defence was vigorously taken in hand. A balloon barrage corps was formed under the Royal Air Force, for the protection of London in the first instance. The anti-aircraft units of the Territorial Army were strengthened. Measures of anti-air raid protection were taken. In these we were much belated as compared with some other countries. In Russia and in Germany the associations known as the Osoviakim and the Reichsluftschutzbund had been formed to organise the measures necessary for such protection. Our own arrangements, if tardy, were comprehensive and thorough when they did come. By the close of 1937, no less than 22,500,000 gas masks, out of a total of 50,000,000 to be eventually provided, had been manufactured and stored. Many scores of thousands of the employees of local authorities and all the police of the country had been trained in anti-gas and general air raid precaution work by the same date. In March, 1938, Sir Samuel Hoare, the Home Secretary, issued a call for a million volunteers for duty as air raid wardens. The duty of preparing protective schemes became compulsory for local authorities under the Air Raid Precautions Act, passed in December, 1937, and all such authorities had at least made a beginning of the necessary work by the following spring. Great Britain, for the first time since 1918, became air-raid-conscious in the winter of 1937-38.

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Now, there are two things that are specially notable in the array of measures of air rearmament and anti-aircraft protection which are in progress here and abroad. The first is that particular attention is being paid to the safeguarding of the great cities from attack. The second is that the aircraft which are being built contain a high proportion of heavy, long-distance bombers. The inference is that everyone is expecting the cities to be attacked and that the most effective means of countering such attack by *active* measures of defence is considered to be the raiding of the enemy's cities in turn. That London is expected to be a magnet for the enemy's bombers is clear from the siting of a ring of fighter squadron stations around it and from the provision of the balloon barrage. The construction of public gas-proof shelters, the advocacy of the gas-proofing of rooms in private houses, the organising of auxiliary fire services, fire brigade reserves, first aid and rescue parties, decontamination squads and other services of the kind in even the purely commercial (retail) and residential districts of London and other towns point clearly to an expectation that such districts may be the recipients of an enemy's bombs. The fact that we are providing ourselves in increasing volume with the means of serving the enemy's cities as he may serve ours is perhaps the best assurance of our safety in a situation which is quite tragically absurd in this twentieth century of the Christian era.

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Tragedy indeed it will be if what everyone is clearly expecting does in truth come to pass. The bomb-loading capacity of the newest machines is far in advance of anything used in the Great War. Then, no machine could carry more than a ton of bombs. Now, the American Boeing 299, as Von Poturzyn points out,¹ can carry four tons of bombs, with a radius of one thousand kilometres, and even that is not the last word in bomb-loading capacity. The hitting power of the giant bomber has become terrific. Its effect is incalculable. It is indeed the "X" of the whole problem. Until the new monsters are tried we can only guess vaguely at the effect of their blasting breath of flame.

Mr. F. Morrison² calculates that the effect of one 5,000-lb. bomb dropped in Parliament Square and another in Horse Guards Parade would be to leave very little of administrative London standing. What happens to Whitehall may happen equally to the Wilhelmstrasse or the Quai d'Orsay district. "Cave man stuff" can be sent one way as well as the other. There are no one-way streets in the air.

Whether the destruction of even a large part of a great city would compel a virile nation to bow to an enemy's will is, as the writer shows elsewhere in this book, extremely doubtful. That the destruction would be an unutterable calamity,

¹ *Luftmacht*, 1938, p. 34.

² *War on Great Cities*, 1937, p. 194

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a stupendous disaster for the city attacked, there can be no shadow of doubt whatever. It would be a horror unparalleled in the grim annals of war.

The very magnitude of the disaster that is possible may prove to be a restraining influence. Because the *riposte* is certain, because it cannot be parried, a belligerent will think twice and again before he initiates a mode of warfare the final outcome of which is incalculable. The deterrent influence may, indeed, be greater than that. It may tend to prevent not only raids on cities but resort to war in any shape or form. No one can tell what will happen if war does come. Its momentum may carry it to lengths not intended before it began to gather speed. Wars have a way of deteriorating in their course.

Omne ignotum pro magnifico. At present air attack is regarded as a menace, a withheld thunderbolt, an impending calamity. All nations fear it. For that very reason it should be a deterrent influence against war.

In the House of Lords on 9th April, 1930, the late Lord Thompson said: "If the bomb acted as a deterrent [against war] and he thought it did, he should have thought that was an added reason for the employment of the Air Force." His words were echoed by Wing Commander James in the House of Commons on 29th April, 1932, when he said that because war is so likely to be horrible, air power will prevent it.

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“ One sword keeps another in its scabbard.” That is an old and a true saying. It is truer than ever when the sword is a heavy bomber and the scabbard its hangar. The dangerous situation is that in which one party to a dispute is powerfully armed in the air and the other is defenceless.

Our innovation of 1936 should cancel a material proportion of the premium which air power puts on aggression.

“ The air weapon,” says Mr. H. A. Jones,¹ “ has conferred an advantage upon any nation which may be tempted by the possibility of an aggressive war. Such a country might build up reserves, against an approximate date, in the firm belief that the war might be won in the air before the opposing nation had time to organise its aircraft industry for production on a war scale. Provided the defending country began with inadequate reserves, the aggressor nation should find itself, after a short period of intensive fighting, with a mastery of the air which could not be effectively challenged for some time, perhaps for months. If such conditions came about, the defending nation would be unable to take action against air attacks aimed at the destruction of its aircraft industrial centres, and so might never be enabled to develop its air strength at all. If these observations be well founded, and they appear to be indisputable, it is clear that adequate, even generous, reserves, whether of aircraft or pilots, or of industrial organisation for immediate and sustained output, are indispensable if a nation is to be in a position to maintain air warfare.”

The reserves, so far as aircraft are concerned, Mr. Jones places at 500 per cent. of the first line strength. The monthly wastage in war, he suggests, is likely to be in the neighbourhood of 80 per

¹ *The War in the Air*, VI, Chapter II.

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cent., and a period of six, possibly twelve, months must elapse before war production gets into its stride. During that period a country which is defending itself must depend on reserves accumulated before the active war begins, and it must be ready at the same time to produce aircraft in increased volume to maintain its front line squadrons. The system of pre-war production which we inaugurated in 1936 should help us to achieve these ends.

The last war came, to Britain at least, as a surprise, a thunderclap. We were all going about our ordinary businesses in July, 1914. We were not prepared then. We are prepared now, or are rapidly becoming prepared, and we are thinking in terms of war—a defensive war. If we were not we should not be buying enormous supplies of wheat and other commodities as a reserve for an “emergency” (to use the official euphemism for a sudden attack from Germany). We have the means, which we had not in 1914, of intervening powerfully and at once in a continental struggle. We could do so then only by means of the slow pressure of sea power, and an aggressor could always hope to win his war before that took effect. Air power, while impairing our own insular security, has made us at the same time a formidable foe to any State which disturbs the peace in a manner detrimental to our own interests. That change ought to make for the preservation of the peace of Europe.

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History is full of the wars that were never fought. Air power will probably add to their number. Is it not indeed conceivable that we are on the threshold of an era in which wars will be won *before* they are fought, in which the story will stop short at the point to which *this* chapter carries it—"Air Power in Action : Stage One"—and will not go on into the next—"Air Power in Action : Stage Two"? It seems to the writer, at least, to be not entirely impossible that some such development may come to pass. Nations will know fairly well of what air effectives their neighbours can dispose. They will have means of telling how each potential peace-breaker has succeeded in the war of the workshops and the forges. They will measure air strength against air strength and will make a shrewd guess at the result if one is pitted against another.

It is after all mainly a matter of the drawing office and the factory, of design and production. of jigs and tools and so forth. Whatever Napoleon may have said, the material factors are in this kind of warfare at least as important as the moral. It is a question, indeed, of comparative horsepower, of wing-loading ratio, of such details as propeller efficiency, slip-stream loss, drag coefficient, of range, ceiling, rate of climb, speed and manœuvrability, of armament and volume and speed of fire, of technical performance in general. It ought to be possible to arrive beforehand at some idea as to the side which has an

advantage in these various respects and as to which is more likely to be able to dump the larger quantity of high explosive upon the other. The chances—if any—of its being prevented from doing so should also be assessable. There are, in fact, all the data for the setting of a problem in a Kriegsspiel or war game. May the nations not come to see the wisdom of doing that, of calling it a war, of cooling their heels for a bit, and, in short, of having some common sense?

They would certainly be wise to do so when the air armaments on each side are more or less equal. They will know that, given powerful air fleets on each side, given also in each nation the fibre and spirit needed to endure the blows of air power, and given, finally, the impossibility of hitting without being hit in return, any advantage to be gained from a resort to force can rarely compensate for the damage that must inevitably be suffered. The wise statesman will be inclined in such circumstances to let the quarrel go by default unless the stake is one of absolutely vital importance. Wars have been fought again and again for issues not of the first moment, objectively and dispassionately considered. There will be a tendency in the future not to fight such wars at all.

CHAPTER VIII

AIR POWER IN ACTION : STAGE TWO

ONE speaks of air power, but actually there are half a dozen different air powers. There would be only one if there were only one bombing and bombable kind of man, the world over ; but such a man is as mythical as the "economic man." He does not exist. Indeed, for that matter the "man in the street," of whom one hears so much, does not really exist as a single, objective entity. We know from the *Autocrat of the Breakfast Table*—if we ever read him in these days—that every John or every Thomas is really three-fold, so that there are six persons taking part in every duologue.

Air power is more complex still. It is, in itself, a great force for righteous defence, a terrible menace, and (to the more or less disinterested third party) simply an international nuisance, according to the point of view. But over and above these complexities there emerge in any analysis of air power a number of variable elements which make its qualities in general and its action in any particular instance most difficult to define and to predict.

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The character of the possessor of air power, the character of the potential victim of its blows, the nature of the war in which it is used, the relation of the use of it to the use of land or sea power or both in the particular war, the stage of that war at which its possible effect is evaluated: all these are considerations which must be taken into account in any attempt to forecast the future of air power. There is nothing static about the problem. It is one in which the factors, the data, are themselves variable. The solution cannot be certain.

The answer to the question—How will air power be used in a future war?—depends in the first instance upon the answer to the prior question—Who will the user be? The user may be a State in which either a democratic or an authoritarian régime is in force. It may be a State whose rulers are necessarily mindful of the feelings of the man in the street or one in which the individual counts for nothing. In the one the people may be the real rulers; in the other a dictator may be at the head of “a nation well drilled and well gagged and well cowed.” In foreign relations the policy of the one may be pacific, reasonable, conciliatory; in the other it may be a policy of the jack-boot, thrusting, aggressive, riding rough-shod over weaker brethren. One State may be a good citizen of the international world; the other may be a most inconsiderate and undesirable neighbour. In the one it would be impossible to imagine its

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rulers being callously indifferent either to the sufferings of its people or to the good opinion of neutral States ; a hard-hearted indifference to both would be conceivable without much effort in the other.

The nature of the governmental régime in a State must affect inevitably the reaction of its people to the strains and stresses which hostile air power in action will impose upon its structure. Indeed, the formation of authoritarian types of States, according to Herr F. A. Fischer von Poturzyn,¹ was the historical outcome of the development of aviation. Since the entire population is now exposed to the vicissitudes of war a strong central organisation and a disciplined people are necessary, he states, if war is to be successfully waged in future. Only in those States which believe themselves to be young and which look forward to a greater future will the measures be taken which are required to bind the nation into a unity and to enable it on the one hand to forge a powerful air force and on the other to endure without flinching the blows of an enemy's air attack.

It remains to be seen whether, in fact, the authoritarian type of government will prove to be so much superior to the democratic in the war of the future as Herr von Poturzyn thinks. There may be in the latter hidden springs of resistance and determination which are lacking in countries

¹ *Luftmacht*, 1938, p. 25.

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where individual freedom is dead. Undoubtedly, however, democracy must be ready for sacrifices which, endured voluntarily, will be as surely necessary for victory as those which are exacted under a dictatorship by the iron hand. In particular, it must be prepared to organise measures of passive defence in the most thorough manner. The efficacy of a system of passive defence depends largely on the efforts made by the people for whose protection it is designed. It is one of the four essential components of the system of air defence as a whole, the others being the counter offensive, the fighter aircraft and the active ground defence.

Clearly air power is likely to be differently conceived and differently handled in the one type of State referred to in the foregoing paragraphs and in the other. The nature of the particular war which is postulated will affect the forecast also. The "next war" which is referred to in this book is, it is true, a major war in which the belligerent States are within bombing radius of one another, though not necessarily having a common frontier. Even on that assumption, however, the use and effect of air power will depend on circumstances which are variable.

The use of air power may be affected, for instance, by the fact that though the principal parties have no common frontier, one of them is allied with a State contiguous to the enemy State. The main conflict may then be on land, and the immediate and pressing task for the

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belligerent who is himself free from any danger of invasion may be to prevent his ally from being overrun. His air arm may have in that event to fulfil a rôle which is more subsidiary to that of the land forces than it would probably have been in a single-handed war.

On the other hand, if there is no such immediate danger of the continental ally being overrun, the effect of the alliance may still be to enable the other (presumably an island) Power which is a party to the alliance to take a much more effective part in the air operations of an independent kind. Suppose, for the sake of example, that we and France were at war with Germany. Notwithstanding the serious administrative difficulties of basing very large numbers of modern squadrons on foreign soil, we should arrange in that case, it is to be assumed, for the use of aerodromes in France by our bombers, which would then be able, with the French bombers, to raid the interior of Germany with far greater effect than if they had to start from bases in Britain. The jutting barrier of Belgium and the Netherlands would not in that event be interposed between us and Germany—a barrier which, as Air Commodore Charlton shows in *The Menace of the Clouds*, is a disadvantage to us.

The stage in a war at which air power is used may also affect the manner of its use and its effect. If a war is going well for the belligerent at whose point of view one is standing, if his

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land forces are sweeping ahead, if the "home front" is sound, there will be little incentive to the trying of experiments. If, however, affairs are going badly for that belligerent in the field, if he is suffering from the stranglehold of the enemy's blockade and economic pressure, if he is blocked on land, he may be disposed to risk a gambler's throw. He may be tempted to embark on methods of ruthlessness, on land and sea, which may indeed recoil upon his own head, but do hold out meanwhile some hope of enabling him to turn the scales of the war. Air power may then be used in a manner in which it would not have been used if the situation were more promising.

One form which the ruthlessness bred of desperation may take is the disregard for neutral sovereignty in the air. If the practice of the late war is followed, entry of and passage through neutral jurisdiction will not be allowed to belligerent aircraft. The practical difficulty is that such entry and passage cannot be effectively prevented if the aircraft are flying at a great height. The temptation to infringe neutral sovereignty where a more direct route to and from the enemy's territory can thus be obtained may be found by a hard-pressed belligerent too great to resist. Whether he will in fact yield to the temptation must remain one of the unknown quantities of the problem of the use of air power.

It is possible, of course, that resort to the

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policy of ruthlessness may be a feature of even the earliest stage of a war. Proverbially it is wisdom to strike first, and it is at least possible that a sudden, overwhelming blow may be aimed at the enemy's heart before the war has well begun. The quickest path for the delivery of that blow may lead through a neutral State's atmosphere. A belligerent may be disposed, if only he can succeed in crushing his enemy's power at the outset, to throw all scruples to the winds and to "damn the consequences." The degree of the probability or improbability of his doing so cannot be assessed. It is obviously a possibility against which the other belligerent must be on his guard. The latter's state of preparedness and his capacity for a swift and even more damaging *riposte* may be the effective factor in the other's decision. There is no excuse for any nation being unmindful of such a danger as this in these days when so many signposts on the roads of European politics proclaim the warning: Major War Ahead.

In the last and some other respects the nature of the particular doctrine of air warfare favoured by a belligerent State will be a further complicating element. There are ideologies in this sphere as well as in that of national politics. In Great Britain, indeed, we have no rigid doctrine. The Air Force would be used whenever and however it would best serve the general aim of defeating the enemy. We are not tied to any fixed policy such

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as that of subordinating the air arm to the other arms of war. The creation of a separate Air Force and Air Ministry in 1918 ensured that that danger should be avoided. Where there is no such independent organisation, and especially in countries which have large armies, there may be a tendency to look upon air operations as necessarily secondary to land operations. On the other hand, there may be in some countries a disposition to treat the air as the primary arm in all circumstances. In Italy, for instance, the action of the air arm in mass is apparently regarded as principal and that of the other arms as secondary. It is true that Marshal Badoglio emphasises in his book¹ the importance of visualising war as "an harmoniously co-ordinated use of all the armed forces." On the other hand, in a memorandum which accompanied the Italian Army estimates for 1938, General Pariani, the Under-Secretary for Defence, uses these words: "In a future European war, and that means a world war, aviation will play the principal part, directing and dominating the course of the war and the course of history." It is perhaps natural that such a view should be held in the land of Giulio Douhet.

Will air power thus direct and dominate the issue of a future war? That is one of the great problems. It cannot be resolved with certainty until it is resolved in the crucible of war. It is full of baffling queries, to most of which different

¹ *The War in Abyssinia*, 1936, p. 171.

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answers might be given, and none could be definitely affirmed to be right—or wrong.

How, for instance, will air power fare in the encounter with sea power? Will the bomb and the aerial torpedo master the warship, or will the attacking aircraft be subdued by the “Chicago piano,” the multiple machine-gun and the other anti-aircraft armament of the ship? One could quote confident prophecies on each side. The trouble is that no one knows what will happen.

How, again, will aircraft affect sea-borne trade in war? Will they dragoon it off the seas? Is the view of Admiral Sir Herbert Richmond¹ or that of Captain Liddell Hart² likely to be endorsed? The former holds that :

“There is far less danger to shipping from the air than from surface vessels. In those areas in which an air flotilla can operate, surface flotillas can operate with far greater effect; and they can do so not merely in accordance with custom and humanity, but in all weathers and for a full twenty-four hours a day.”

Liddell Hart, on the other hand, writes :

“To-day the seaplane or flying boat is a greater potential threat to sea-borne commerce than ever was the U boat; its range has so extended that the Mediterranean, for example, has been reduced to a narrow channel wherein the flow of merchant shipping could be blocked as easily as of yore in the English Channel.”

Captain Liddell Hart's view in regard to the possible closing of the Mediterranean to sea-borne

¹ *Sea Power in the Modern World*, 1934, p. 117.

² *When Britain Goes to War*, 1935, p. 105.

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traffic in war is supported by that expressed by Mr. H. C. Bywater in a paper which he read at the Royal Institute of International Affairs on 2nd February, 1937.¹ In this paper he suggested that "the aircraft menace to shipping in a future war is a real one and that it was equally real in the late Mediterranean crisis." He considers that if we are at war with a first-class Mediterranean Power we may have to declare the Mediterranean "out of bounds for all non-combatant traffic."

In the same paper Mr. Bywater referred to the possibility that aircraft may adopt the same "sink-at-sight" policy against merchant vessels which the German submarines practised in the late war. "I have reason to believe," he said, "that certain people at the Admiralty . . . refuse to visualise the possibility (to put it mildly) that a future enemy may use his aircraft against our merchant shipping. I hope I am not a cynic, but I wish I could feel equally confident." Recent experience in the Mediterranean tends to justify these fears.

In a series of articles in the *Revue des Deux Mondes* in 1927, General Niessel prophesied that aeroplanes would sink merchant vessels without warning and without mercy. His grim forecast may be realised. Some of the actions of the Spanish Nationalist aircraft in the Mediterranean in the spring and summer of 1938 are ominous

¹ Printed in *International Affairs*, May-June, 1937.

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in regard to future possibilities. Perhaps the danger may be lessened if, before the next war comes, the rules restricting submarine warfare are extended to aircraft.

The rules in question were so extended in effect for the special purpose of suppressing " piracy " in the Mediterranean in the autumn of 1937. The nine States who were parties to the Nyon Arrangement agreed on 17th September, 1937, to protect non-Spanish merchant vessels from attacks by aircraft which violated the rules laid down in the London Naval Treaty of 1930, that is, the so-called submarine rules. It is much to be desired that the principle of this agreement, of limited application, should be embodied in a general Convention. If observed, it will prevent the resort to methods of frightfulness to which the lack of any international agreement upon the subject may otherwise serve as an invitation.

Even if such an agreement is made and honoured, however, the lot of merchant vessels may be an unenviable one in a future war. We may see in being a system of the diverting of ships by order signalled from belligerent aircraft, which will direct them to proceed to a named harbour for visit and search. Obedience to the order may be enforced by bombing, and if the order is ignored it will not always be possible to ensure that the crew and passengers are placed in safety before a ship is sunk.

In all narrow waters the flow of maritime

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commerce may be practically blocked, or traffic at least made so difficult as virtually to be brought to a standstill. Protective measures of various kinds will, of course, be taken. A large number of old cruisers, it has been officially announced, are to be converted to anti-aircraft vessels. Our British merchant shipping, one need hardly doubt, will survive the ordeal. But there will be anxious moments and perhaps terrible experiences to be lived through before the happy ending comes in sight.

The folk who live in cities will not escape the flick of the whip with which air power will scourge those who go down to the sea in ships. It may indeed be that for their chastisement scorpions will replace the whips. Here, again, one is in face of an enigma. One cannot foresee what may happen.

Will the cities be attacked? If so, will the attack or the defence prevail? Will they be bombed indiscriminately? Will the bombardment be limited to military objectives? Will a bombardment so limited be substantially different in its effects from unrestricted bombardment?

The bomber, we are often warned, will always get through. In course of time the odds on the defence may be greater. "For my part," said Mr. Churchill in the House of Commons on 27th January, 1937,

"I believe that the day will come when the ground will decisively master the air and when the raiding aeroplane will be almost certainly clawed down from the skies in

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flaming ruin. But I fear that perhaps ten years, ten critical and fateful years, will pass before any such security will come, and that in the interval only minor palliatives will be at our disposal."

Mr. Churchill reverted to the same subject in the debate on the Civil Estimates on 27th July, 1937. He said :

" If one could be sure that ten, or perhaps eight, or even seven years of peace lay before the world, I would hazard the opinion which I have indicated before, that the ground will master the air, and that the problem of the marauding aeroplane, slaughtering indiscriminately the civilian population, not merely attacking focal points, but seeking to blackmail nations out of their liberties by an act of mass terrorism, that horrible apparition that has been reserved for our age to see, will have passed away as a menace from the civilised world."

Sir Thomas Inskip, the Minister for Co-ordination of Defence, replying to the debate, stated that the research committee had been very active and had produced very remarkable results, but he could not even drop a hint at the results which it had attained " and how much stronger we are in air defence in consequence of its discoveries and the application of its discoveries." He expressed the hope that the immunity to which Mr. Churchill referred might be attained even sooner than the eight or nine years which he had mentioned. Sir Thomas Inskip's very guarded reference to the results of scientific research into anti-aircraft defence was notable for its implications.

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Meanwhile, the chief reliance of the defence, so far as it is ground defence, must be placed upon anti-aircraft artillery. Anti-aircraft fire was on the whole ineffective in the Great War. Bombing pilots disregarded it, indeed jested at it on occasion. It has been greatly improved since then, but events in Spain do not point to its yet being within sight of mastering the air. The effect of anti-aircraft fire in the fighting in that country, says Herr von Poturzyn,¹ has not been very considerable, though some good results have been reported on the Nationalist side. Of the aeroplanes lost in action by the Nationalists, one-fifth, he states, were brought down by anti-aircraft fire: a statement which, it must be added, other authorities would regard as a gross overestimate of the proportion of losses due to fire from the ground.

Germany, according to common report, has developed anti-aircraft gunnery to a higher degree than any other nation. The German 8·8 centimetre and 1½-inch guns, for use respectively against high and low flying aircraft, are extremely formidable weapons, and German anti-aircraft gunnery is of a very high quality, technically.

Reference has been made in Chapter II to the use of balloon barrages in the Great War. They were not without their utility then, though the instances of aircraft colliding with the wires were very few. According to an article in *Science et*

¹ *Luftmacht*, 1938, p. 88.

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Monde, translated in the *Air Review* for June, 1936, the barrage established round Paris in March, 1918, had a notable effect in reducing the number of bombers who were able to reach their objectives there. "The moral effect, the incalculable but ever-present risk that a raider would run into a cable, was considerable," the writer of the article stated.

The psychological effect is likely to be the most important one also in a future war. Raiders will not know how high the barrage has become or (since it will now be mobile) exactly where it is. They will have to fly high, when they will be a better mark for the anti-aircraft guns and fighter aircraft than if they came lower. Aiming will be more difficult for the bombers, though this, unfortunately, may result in less discrimination in bombing. The cables, it is expected, will be lethal and the balloons themselves may be filled here and there with high explosive, to be fired electrically if an enemy comes close in trying to shoot them down.

There is certainly no assurance that the balloon barrage is the secret of the protection of cities and vulnerable points from air attack, but it may be a contribution to that end. It will "worry" the raiders and thus assist the other means of defence. Here, too, as elsewhere the future may have surprises in store. Improved apparatus and methods may make the balloon barrage a formidable barrier to raiding aircraft.

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What of the interceptor, of the fighter machine ? Here, again, immense strides have been made since the late war. Then, the fighter carried two machine-guns, firing forward. Now, it carries a whole battery of them, in the wings ; the Hurricane, for instance, has eight Browning guns. Its speed, too, has been trebled, its rate of climb has been enormously accelerated, its ceiling greatly elevated. On the other hand, the performance and armament of the bomber have been improved, too. Flying in formation, a fast bombing squadron will be no easy prey for the fighters. The bomber's blind spot, below its tail, has been eliminated in the newest types.

In the Great War bombers came off second best on many occasions in their encounters with the fighters. The French abandoned long-distance bombing by day because of the losses which they suffered. In a day raid upon Oberndorff in October, 1916, a French bombing squadron was practically destroyed. Our own bombers, too, had more than one day of calamity. Reference has been made in Chapter II to the disastrous losses which No. 99 Squadron suffered in its raid of 31st July, 1918. The same squadron had another unhappy experience on 22nd August, 1918, when it lost seven out of its twelve machines. American squadrons were almost annihilated on two separate occasions. In the great German raid upon south-east England on the night of 19th-20th May, 1918, six of the bombers were

brought down—three by our fighters, three by anti-aircraft fire.

Will the fighters take a similar toll of the bombers in the next war? Events in Spain give ground for thinking that they may. The numbers of the *Air Review* for May and November, 1937, contain extracts from articles in the French technical journals, the *Revue de l'Armée de l'Air* and *L'Aérophile*, which give some exceedingly interesting information upon this subject. It is stated that, by day, the heavy bombers have had to be escorted by fighters, six or twelve in number, and even then had their losses. The multi-engined bombers, especially those with water-cooled engines, were particularly vulnerable when attacked by multiple-gun fighters. The Savoia 81 was usually shot down when attacked by three fighters simultaneously. Modern steel-jacketed bullets were found to do great damage to all-metal aeroplanes, sometimes blowing holes of eight inches in diameter in the metal coverings. Light bombers, such as the converted Douglas civil machine, were able to avoid attack by their speed, and these fared better than the heavy bombers. The conclusion of the French observers, it is stated, was that "the flying fortress"—the heavy bomber which can take care of itself and beat off all attack—does not exist; speed alone gives some security to the bomber.

The information given in the articles quoted

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above tallies with that given by Herr von Poturzyn.¹ Contrary to what had been expected, he says, bombing formations in Spain have had to be escorted on day flights by fighter machines. General Franco's bombers, at first at any rate, were neither very fast nor very well armed, and, in spite of their good flying discipline in formation, could not always protect themselves from attacking fighters. The practice of escorting them was consequently adopted. Although the Russian bombers employed on the Government's side were as fast as Franco's fighters, so that there should have been no necessity for mixed formations, they, too, were accompanied by protective fighters. In China, also, the bombers have by no means had it all their own way. In the raid which 50 Japanese aircraft carried out against Hankow on 29th April, 1938, no less than 18 are stated to have been shot down. It is indeed evident from what has happened in Spain and China that it is by no means such a foregone conclusion as has been thought that "the bomber will always get through."

Since the rôle of the fighter is, for this purpose, defence, one can only pray fervently that the lesson which Spain appears to teach in this respect will be confirmed in the next major war. The bomber, one need not doubt, will be faster and better protected than it was in the Spanish fighting, but the fighter will be improved, too.

¹ *Luftmacht*, 1938, p. 85.

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The encounter between them in the next war should be an epic one, stupendously staged. The running fight when a huge formation of powerfully armed fighters engages a huge formation of only slightly less powerfully armed bombers, against a background of the heaven's embroidered cloths, will be a fit subject for the brush of some greater Gustave Doré of the future.

Where will that fight be fought out ? Perhaps by that time there will be in existence fighter aircraft of the kind which Captain Norman Macmillan suggests¹—" a long-range, high-speed, heavily-armed fighter, equipped with guns as well as machine-guns and carrying perhaps some kind of depth charge." It will fire explosive shells and ultra-velocity bullets. The short-range fighter, he points out, can do little more than engage the enemy after they have crossed the frontier and will not be able to stave off the attack from the civil population. He advocates a fighter that can carry the war into the bomber's own country.

Meanwhile, some of the bombers at least will come through. What will they do then ? As the writer has already shown in this book, a common assumption is that they will attack the towns and cities of the enemy's country and will not confine themselves to the military objectives therein. The fact that air raid precautions are thought to be necessary in wide districts which contain no military objectives whatever points to such an

¹ *The Chosen Instrument*, 1938, pp. 59, 136.

assumption. One may hazard a doubt, however, whether the indiscriminate bombing of cities is so certain to be seen as some of the prophets of calamity foretell. It is interesting to note that a similar doubt is expressed by the American writers, R. E. Dupuy and G. F. Eliot, in their book *If War Comes*.

The danger seems rather to be that the attacks will be directed, or will be claimed to be directed, against points where military objectives exist, and that, the objectives in question being in many instances situated in populated districts, the bombardment of them may at times be not very different in its results from the intentional bombardment of the civilian population. An instance in point was the Japanese bombardment of the Hanyang district of Hankow on 29th April, 1938. Its objective was the Hanyang arsenal, which, according to the Japanese report, was set on fire. According to Chinese reports the only result of the raid was the killing and wounding of about 1,000 persons.

If bombardment, of any kind, were a matter of absolute precision, if it could be guaranteed that every bomb or every shell found the exact billet for which it was intended, the question of the bombardment of military objectives in towns or cities would not be so full of complications as it is. Bombardment is not, however, an exact science. The shell which the big gun launches at a mark which the gun crew cannot see, the bomb

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which an aircraft drops from an altitude of some 20,000 feet, must often go astray. The measure of the error will often be the measure of a tragic slaughter of civilians. It matters little to the mutilated victim of a shell or the bomb whether she received her hurt in the course of a bombardment which was intended for a military objective or was deliberately indiscriminate.

There will often, unfortunately, be no lack of military objectives to which a belligerent⁺ can point when he is accused of bombing a city indiscriminately. A good example is the excuse offered by the Spanish Nationalist Government for the air bombardment of Barcelona in March, 1938. In reply to the British and French protests it was asserted that the city contained a number of factories, industrial undertakings and other military objectives within its confines. In a note issued a little later it was pointed out that Barcelona could not be considered an "open town" since the University, the Colegio de los Escolapios and the old Bank of Spain were used as depots for war material, and a number of factories were producing guns and ammunition. There were also two barracks and various head-quarter establishments, as well as several electric power stations, which were legitimate objectives. There were anti-aircraft batteries, moreover, on the telephone exchange and the Jesuit College in the Calle de Cespe.

The raids of 17th to 18th March illustrate

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well the difficulty which arises in the practical application of the rule (so far a customary rule of international law only) that only military objectives are liable to bombardment. There were, undoubtedly, many scattered military objectives in the city, and no doubt the bombing pilots tried to find them. They flew at a height of 16,000 feet, however, and according to the statement made by Mr. Chamberlain in the House of Commons on 21st March, "bombs fell all over the city and appeared to have been dropped at random." It is clear from the protests made by the British and French Governments that, in their view, the bombardment was, in its results at least, a deliberate bombardment of the civil population. The logical inference is that, in these Governments' opinion, the bombardment of even military objectives cannot be justified if it causes widespread and disproportionate losses to the civil population in the vicinity. It is much to be desired that a rule to this effect should be embodied in an international convention. Otherwise, what happened at Barcelona will happen on a larger scale, in all probability, in the next major war—and will be excused on closely similar grounds.

Will gas be used in the next war? That is another of the great enigmas. Here there can be no shadow of doubt what the international law upon the subject is. Gas is definitely banned by the Geneva Gas Protocol of 1925, to which

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practically all civilised States are parties. The existence of that international ban is ignored by some writers. Captain J. R. Kennedy,¹ for instance, speaks of gas, sprayed by aircraft, as "the means by which the scientific State may conquer its uneducated opponent," and refers to chemical warfare as "the triumph of science over the brutal weapons so far used in war." The fact remains that we and other nations have agreed not to use gas, whether its use be scientific and beneficent or not. That, however, does not clinch the matter, unfortunately. Protocol or no Protocol, it will probably be used if a belligerent thinks that its use will enable him to win the war, and to win it before the enemy can use gas more effectively still. Germany bitterly regretted her initiation of the use of gas in the spring of 1915.

It is notable that gas has not been used in the air bombardments in Spain and China, so far as can be ascertained. The party of British Members of Parliament, representative of all political parties, who visited Spain in November, 1936, stated in the report which they issued on their return that there was substantial evidence of the use of a small number of gas *shells* by the insurgents in the University city at Madrid ; they made no mention of the use there or elsewhere of gas bombs, nor were any used later, by either side, said Mr. Duncan Sandys in his account in the *Daily*

¹ *Modern War and Defence Reconstruction*, 1936, p. 206.

Telegraph, 8th and 9th April, 1938, of his and Mr. Simmonds's visit to Spain.

It is clearly necessary to be prepared to meet gas bombardment and to organise the necessary measures of protection—as well as those for retaliation. It is questionable, however, whether too predominant a place is not being given to anti-gas precautions in the measures of protection which are being organised in this country. Viscount Trenchard suggested in the House of Lords on 13th December, 1937, that we were expending too much energy on all the precautions against gas. There was a far greater danger of panic and material damage, he considered, from the high explosive bomb and the incendiary bomb. Professor J. B. S. Haldane, too, stated at a conference on 22nd March, 1938, of the Joint Committee of Peace and Professional Organisations in Public Offices, that, from what he had seen in Spain, he considered that the City of London had not much to fear from a gas attack. The danger from high explosive bombs would be greater; he thought incendiaries would be less damaging.

If capital cities and other great centres of population are severely bombed, with or without the use of gas, will the moral effect be such as to destroy a nation's will to resist? He would be a bold man who, remembering what has happened in China and Spain, would assert confidently that it will. He would be hardly less

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bold who affirmed dogmatically that it will not. The bombardments which we have seen of late may indeed be far surpassed in intensity and frequency by those of a major war between two Powers disposing of immense strength in the air. Nevertheless, it is doubtful whether even the most ruthless bombardment will break a virile nation's will to resist. Its effect may be to steel the nation to greater endurance. "You cannot scare great nations into submission by destroying their capital cities," said Marshal Foch in an interview in 1926.

Mr. Lloyd George in his *Memoirs*, referring to the German air raid of 7th July, 1917, upon London, speaks of the "grave and growing panic amongst the population in the East-end, where the attack had taken place." The tubes were packed with men, women and children after that raid and the commons around London were crowded with refugees on every clear night. Yet, he adds, "the undoubted terror inspired by the death-dealing skies did not swell by a single murmur the demand for peace. It had quite the contrary effect. It angered the population of the stricken towns and led to a fierce demand for reprisals."

It must be remembered, however, that the destructive power of the bomber has increased enormously since 1917, and the result of intensive air attack might be very different to-day—unless there is in existence a thoroughly organised system of passive defence.

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If, however, the bombardment is so directed that a nation's capacity to fight and to rearm is impaired, if its armed strength and the sources of that strength are the objectives of the enemy's attacks, if its depots, its munition factories, its war industries are destroyed or seriously damaged, then a time may come when, whatever be the spirit of the nation, it will find itself unable to continue the struggle. Air power may in fact prove itself capable of effectively disarming even a powerful nation, but only if it sets itself to that task : which is a different task from trying to bomb civilian populations into defeatism. An attempt to achieve the latter aim may be countered by evacuation of populations or other protective measures such as the provision of deep shelters. Great munition works cannot be transferred in an emergency or placed underground.

Even if the works are not destroyed or seriously damaged the effect of raids and of alarms of raids may be to interrupt and disorganise the production of munitions to a disastrous extent. Reference has been made in Chapter II to the results in this respect of the German raids in the late war. It is difficult, says Group Captain J. C. Slessor,¹ to resist the conclusion that intensive and continued air bombardment can restrict the output of war industry to such a degree as to make it impossible to meet the requirements of an army

¹ *Air Power and Armies*, 1936, p. 68.

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of the 1918 model in weapons, ammunition and warlike stores. If after the second battle of Ypres, in 1917, we had concentrated every available bomber on raiding the industrial centres of Germany during the autumn and winter, it is doubtful, he considers, whether the German attack of 21st March, 1918, could ever have materialised. It may be, indeed, that the effect of air attack on the sources of air supply will be to make it impossible to meet the requirements of a great modern air force. The inevitable reduction in the output of aircraft which must result from such attack may make it very difficult to maintain air operations with the intensity which has commonly been envisaged.

It is clear, however, that no nation believes that victory can be achieved by air raids alone. In every great State preparations are being made which would be meaningless on any other supposition than that the next war is expected to be a war of all arms. If one belligerent mixes the fighting his opponent has no alternative but to do the same. The air arm has not yet turned the other arms out of house and home. Nothing that has happened since the Great War goes to prove that armies and fleets are obsolete. The evidence is all the other way.

The war of attrition, of troglodytic masses who emerge from their trenches occasionally for futile attempts to break through, may be dead, as is the war of close blockade and of some other

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maritime practices of the past. But armies, largely mechanised, there still will be. Warships, cruisers and destroyers will still keep the seas. If they did not, air power might itself be immobilised. Despite hydrogenation and low temperature carbonisation imports of petrol from the Americas and Asia will still be needed, and the tankers which convey it will have to be protected. No competent war cabinet or council is likely to ignore that and other facts. If it does, it may have a rude awakening.

Air operations against warships will include, one must expect, attacks upon naval ports and dockyards; against armies they will embrace attacks upon their lines of communication and supply. The fighting strength of the enemy can often be best disabled by striking at the maintenance system of the force rather than at the force itself. But it is for the purpose of the defeat of the latter that the lines of communication or supply will be attacked. The tasks of ground and air forces will in this respect be complementary. The task of the ground forces, says Group Captain Slessor,¹ will be to turn or to penetrate the enemy's line; that of the air striking force to attack his communications and to prevent the arrival of supplies and ammunition at the front. No attitude, he adds, could be more vain or more irritating than to claim that the next war will be decided in the air alone. The

¹ *Air Power and Armies*, pp. 213, 214.

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air will be only one, though the most decisive, of a number of factors favouring the rise of the small, highly mobile, mechanised army of to-morrow. We are unlikely, he thinks, to see again, in the face of air action, "the millions of men, the thousands of tons of ammunition, the network of trenches stretching half-way across Europe, and the vast organisations at the bases and on the lines of communication that turned northern France into a passable imitation of Epsom Downs on Derby Day."

War will be speeded up, in fact, on the ground as well as in the air. There will be more movement, more variation of tactics, more enterprise in attack, than in those trench-bound days of 1914-18. Yet lines of communication and supply there must always be, and these will be a prime target for the blows from the air. Militarily, such targets will perhaps be the most important of all, and the sources of air munitionment will be a particularly vital objective, for if a belligerent can restrict his enemy's output of aircraft, while maintaining his own, he will have gone a considerable way towards winning the war.

It is in the attack upon the sources of an army's supply and munitionment that a meeting place will be found for the rival doctrines of air power—the doctrine of direct action as preached by Douhet and his successors and the doctrine of the more conservative (and more convincing) school

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of thought to which Slessor belongs. The maintenance system of an army may stretch a long way back. Attack upon it will be, in many instances, attack upon the enemy's vital centres. It may therefore achieve at a stroke each of the two objects which are represented as being the primary aim of air power. It may contribute, that is to say, to the crippling of the enemy's forces in the field and to the impairment of the moral of his people.

As E. J. Kingston-McCloughry well observes,¹ an air force can perform simultaneously two operations which an army must take in stages. An army must first defeat the opposing army before it can bring pressure to bear upon the enemy population, usually by means of the occupation of the enemy territory. An air force can produce the desired moral effect in the course of operations which have also a definitely military purpose—the defeat of the enemy's air force and the destruction or disorganisation of the enemy's supply system. It can set itself to the task of breaking the will to war of the enemy nation at the same time as it engages in the other task of defeating or paralysing the enemy armed forces.

It will attain its moral effect, however, only as an incident of operations aiming at a military end, that is, by the bombing of military objectives. The producing of that effect will not be a separate, substantive end, justifying means that would be

¹ *Winged Warfare*, 1937.

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contrary to international law, as would attack deliberately directed against non-combatants. There was something a little ominous in the words which Signor Mussolini used in his speech of 30th March, 1938, when he spoke of the rôle of the air force being "to break up enemy formations, to command the air, and to weaken the moral of the enemy's civilian population." He emphasised the last aim, and underlined the emphasis by adding: "Centres of population on both sides are bound to suffer." True, but their suffering should be incidental, not primary. The only justifiable aim is the destruction of the enemy's armed strength and its sources of supply. The other end must be attained within the limits of the means lawful for the achievement of the primary end.

To confine the air arm rigidly to a single rôle would be to sacrifice its chief asset, which is its mobility, its capacity for being here, there and everywhere. It can and should be employed upon whatever task is likely to be decisive or to contribute most effectively to the ultimate decision. "This," says Slessor,¹ "is a principle of supreme importance in air warfare and is in fact the key to the whole strategy of air power." "Air strategy," he says further on,² "means concentration and concentration depends on mobility." Acceptance of this view carries with it a refusal

¹ *Air Power and Armies*, 1936, p. 70.

² *Ibid*, p. 85.

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to subscribe, on the one hand, to the doctrine of the Blue Sky school, or, on the other, to that which would make the air arm's rôle necessarily subsidiary to the rôles of the other arms of war. It is the basis, indeed, of a philosophy of air power which is flexible, elastic and (in no disparaging sense) opportunist. Air power will be tied down to no rigid formula. It will strike wherever its blow is most effective.

That the air arm should be a "handy man" is, one may note, in effect the moral which Marshal Badoglio draws from his operations in Abyssinia, though he would perhaps link its operations more closely with those of the army than others, not bred to the army tradition, would consider advisable. The air arm, he says,¹

"is the arm of the future. It will play an increasingly important part, in increasingly numerous new spheres of action. But the greater the part it plays, the more closely will it co-operate with the army. Neither the one nor the other will ever again be able to make war alone. The potentialities of the air arm will be greater if its employment, as this steadily develops, instead of being governed by fixed rules and preconceived and supposedly infallible theories, is adapted to meet any possible requirements of any given situation, as appreciated with common sense, and acted upon with equal common sense, by the Commander-in-Chief."

Air Vice-Marshal E. L. Gossage,² too, insists upon the need for co-ordination. He repudiates the suggestion that "the air force has the intention

² *The War in Abyssinia*, 1937, p. 174.

¹ *The Royal Air Force*, 1937, pp. 27-8.

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of fighting a war on its own, divorced from the action of the Navy and the Army." "Such an idea," he says, "would be quite erroneous, as obviously a national war can only be treated as one concern." Action must be so co-ordinated that "the maximum striking force from the air can be applied either as the primary arm with naval and military support, or in direct conjunction with either or both of the other two Services, as circumstances suggest."

"To march to the sound of the guns" has been a working maxim of war for many a year. There is no reason to suppose that it is less true to-day than it ever was, or that the air arm can afford to ignore it. There are times—far greater times, however, when the guns are not sounding, when they are on the move or in store or being manufactured, and the air arm can make for them then, too, in train or depot or park or factory. It can seek them out and so handle them that the guns never sound at all; and it can do so to all the munitions of war, made and in the making. That is the revolutionary contribution of air power to the ancient art and science of war; and, after all, it is only common sense.

Now in countries like our own one would expect a doctrine of air power such as that outlined above, a doctrine which, it is submitted, is at once logical, fluid and adaptable, to commend itself. Unfortunately, all countries are not so governed, and how air power will be used by some of them

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it is quite impossible to foretell. It may be used at the prompting of some dæmon, some product of an emotional or mystical, almost hysterical, process of mind which has nothing to do with logic or common sense. This is one of the incalculable elements of the problem. It must remain incalculable until war comes.

We can at least be fairly sure that in a country like our own air power will be used, in all probability, in accordance with some such principles as these :—

(1) The destruction of the enemy's military strength will be the end sought by air power.

(2) The air arm will be used wherever and in the manner in which its use is best calculated to serve that end.

(3) Attack on the enemy's sources of munitionment and his lines of communication and supply, as well as on his armed forces, will be a very important contributory means to that end.

(4) It is possible, though this is not certain, that military objectives in densely populated centres will not be attacked if they are so situated that bombing would be tantamount, in its results, to indiscriminate bombardment. (Such seems to be the implication of our protest in regard to the bombardment of Barcelona in March, 1938, but the terms were not entirely clear.)

(5) We will not initiate the use of gas.

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(6) Merchant vessels will not be sunk or disabled in any circumstances other than those in which they could lawfully be sunk or disabled by warships, surface or submarine, nor will they be diverted without prior boarding at the place of encounter.

(7) If the enemy on his side uses air power in a different and more ruthless fashion there will be an immediate and effective *riposte* on our side.

(8) We shall be prepared for the worst while hoping for the best.

That is a sane, sensible programme, and the programme most likely to spell success in the end. It is an essentially British conception of the way to use air power—a way that accommodates itself to circumstances, that is not doctrinaire, that is not frightfulness. Mr. Austin Hopkinson was speaking for a great majority of the people of this country when he said in the House of Commons on 15th March, 1937: "The nation which devotes itself to attacks on civilians and which allows its attention to be distracted from the objective of the armed forces of the enemy, that nation, other things being equal, is bound to lose in warlike operations." The whole objective of any force commanded by Englishmen, he said, should always be the enemy's armed force, and he rejoiced that that was a principle recognised by the heads of the Air Force.

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Now, if the enemy does not recognise that principle, if he wants something different, something melodramatic, sensational, something calling for streamer headlines in the popular Press, the lurid kind of thing that we are always being warned that we shall get from the air in the next war—cave-man stuff, hell with the lid off, or whatever the abominable name is for the abominable reality: well, there is little doubt that old England will be able, however reluctantly, to give as much as she gets, and a little more. High-brows look down on Kipling, but there are some lines of his describing the English character which are worth remembering. They are :—

*Measured speech and ordered action, sluggish soul
and unperturbed,
Till we wake our Island-Devil—nowise cool for
being curbed !*

One needs to be Irish, perhaps, to appreciate the truth of that description, and to feel assured likewise that if an enemy is so exceedingly foolish as to use air power in a way which John Bull considers to be “not cricket,” he is likely to be taught such a lesson that no enemy will ever repeat the mistake. Whether such a mistake will be made is one of the unknown quantities in the algebraic puzzle of the future of air power.

CHAPTER IX

SUMMARY AND CONCLUSION

IN this chapter the writer gathers the strings of the argument together and ties their ends. It is a brief summary of the main contents of the foregoing chapters. Because it is, some of the statements made may appear to be too dogmatic, too cocksure. Perspective will be recovered if reference is made to the fuller treatment in the chapters here summarised.

“Air power” is the ability to use effectively the pathways of the air for warlike purposes. It is not command of the air, still less of the land or the sea, in the sense of an absolute denial of the use of those domains to an enemy. It is, broadly, to the air what sea power is to the sea. As between great powers it implies a certain but undefinable standard of strength in the air.

“The next war,” which is envisaged is a war between two or more great Powers within bombing radius of one another. For our particular purpose in Great Britain it is a war such as we waged in 1914-18, but not necessarily with the same, or any, allies on each side. Air armaments as they are to-day, not as they were then, are postulated.

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In the Great War the air arm was still in its infancy. Only intermittently, spasmodically, in truant fashion, did it wander far from the parental eye of the older arms. When it did it achieved at times a notable measure of success. Its raiding attacks diverted from the battle zone *matériel* and *personnel* which were badly needed there, and it went some way towards disorganising the enemy's munitionment.

Its most resounding triumphs were won in close association with the operations of armies. In the autumn of 1918 it proved itself an unrivalled instrument in the pursuit of a defeated foe. More than once it turned a retreat into a disastrous rout.

The Great War ended at last and left men's minds wearied, disillusioned, disgusted with the murderous slaughter, the slow, muddled, wasteful ineffectiveness of the tactics of attrition. The air seemed to offer a way of escape from the condition of deadlock, of stalemate to which war had been reduced. It was a new domain which could be called in, if not to redress the balance, at least to relieve the *impasse* that had been reached in the old.

The Douhet doctrine emerged and its variants followed. Air power could laugh at pill-boxes and concrete emplacements. It could leap over them. It could strike directly at the will and moral of the enemy nation. It could leave the armies to wage their own foolish, out-dated mode

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of warfare if they chose. The road to victory lay through the air: a royal road across which stretched no mutually immobilising lines of trenches. The bomb could smash a way to victory behind the lines when the shell had failed to break the lines themselves.

The new doctrine of direct action became, in the hands of Douhet's successors "a gospel of war and damnation." It was the gospel of the bomb, and the bomb was, for most men, the Beast of the Revelation whose number they could not calculate. They did not understand it. They were bewildered, mystified, out of their depth in face of the new portent. The civilised world took alarm. The first reaction was characteristic.

The bomb, the nations decided, should be banned, as the Second Lateran Council had banned the cross-bow and the long-bow. In fact they did ban it. Forty or more nations agreed at Geneva that bombing should be abolished. But they tacked on to the abolition a saving clause which robbed it, for the time, of all effect. Some day in the future it may be found possible to cut away that nullifying clause from the ban. If it is, then air power as we know it to-day will be no more.

The long discussions at Geneva lost all reality when Germany walked out of the conference in October, 1933. Germany, too, played the next leading card in the tense game of international draw-poker, in which Herr Hitler's declaration of

air parity with Britain in March, 1935, was the first big bluff.

In 1934 Germany had begun seriously to rearm in the air. Other nations, Britain above all, began to rearm soon after. While they were doing so events in three continents served as a kind of dress rehearsal for the greater drama of the first-class war for which all were preparing.

In Abyssinia the aeroplane proved itself to be a powerful weapon of attack in the field, and still more, a terrible scourge for a broken and retreating foe. The Italians conquered Abyssinia in four great land battles—Enderta, the second Tembien, Shire and Mai Chio—and the air arm helped very materially in each. In Spain its tactical uses were again demonstrated. It broke the Basque resistance. It opened the road to Teruel. But the main lesson of the civil war hitherto has been a negative one and the more important on that account—that repeated and devastating attacks upon cities from the air cannot break a determined people's will to war.

In China, as in Abyssinia and in Spain, the tramp of great armies on the march was an echo of the older war and a reminder that its day is not done. Clearly air power has not driven land power from the field. The destructive power of the bombing aircraft was again shown by terrible events at Shanghai, Canton and Nanking, but again the moral of the people was not broken.

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In China, as in Spain, indiscriminate bombing drew strong protests from neutral nations.

Meanwhile the intensive air rearmament went on apace. Side by side with it the nations who thought themselves menaced set themselves to organise measures of precaution against successful air attack. The people became air-raid-conscious. They were inclined indeed to lose some of their sense of proportion in their alarm. They credited the potential enemy air force with an almost miraculous ubiquity. They pictured it raking every hole and corner of the country with bombs. One could only wonder where on earth all the aircraft that would be needed for such universal devastation were to come from. Certainly the programmes of construction in force in the various countries, even Germany's (probably exaggerated) 600 machines a month, would have been insufficient to provide such a surplus over and above the needs of a strictly military order.

Nevertheless, the threat to the cities and larger towns was and is a serious one. The seats of Government especially will be in grave danger. London, Paris, Berlin may suffer very grievously. Rome may be almost unbuilt in a day. But just because these things may happen, because it will be so extraordinarily stupid if they do happen, there may be a disposition to pause and think before a policy of mutual city-vrecking is adopted. That does not mean that the cities will go

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scatheless. The military objectives in them will be bombed—if the bombers come through.

The bombers will not, assuredly, have it all their own way. Multiple-gun monoplane fighters, five times as fast as the wind, eight times as fast as the fleetest racehorse that ever ran, will tear great holes in them with explosive bullets, perhaps with shells. Powerful anti-aircraft guns will make the upper regions of the air a danger zone. Even the despised balloon barrages, by a miracle, may claim a victim. But some of the bombers will come through. Will their bombs decide the issue?

It is doubtful whether they will. If armies again dig themselves into long lines of trenches, if they let themselves become bogged in the morass of another war such as we witnessed in 1914-18, air power may be the only means of breaking the deadlock. The air arm may become the dominant arm then, all other military effort being subordinated to it. So may it, too, if an island Power were engaged, alone, with a continental Power and no invasion were attempted by sea.

It is possible, on the other hand, that war on land will be waged by smaller mechanised forces, venturesome, far-ranging, audacious. An island Power at grips with a continental Power will have allies who are liable to be overrun and in whose fate, therefore, in a war of ground forces it cannot disinterest itself.

A war waged solely in the air is improbable.

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Clearly no great Power is contemplating it. Otherwise the vast preparations that are being made for war on land and sea would be purposeless. Evidently no great Power is prepared to accept unreservedly, of the rival ideologies of air power, that which would dethrone military overthrow in favour of direct action against the enemy population.

Air action will be a factor of vital importance, perhaps the decisive factor, in the next war ; but it will not be the only factor. The day of armies and fleets is not past.

Armies and fleets will themselves attract and suffer the blows from the air. Not only in the battle zone but along the lines of communication and still farther afield will the impact of those blows be felt. Air power will strike at the source of the enemy's armed strength.

But will it strike at that only ? Will it not set itself, and perhaps primarily, to destroy the enemy nation's moral, to intimidate its population into submission ? Will it not seek to break the hostile nation's will to war ?

Yes, assuredly : but it will do so—if it is wise—within the letter of the law, or, rather—though the effect is the same—within the letter of a fundamental and eternal maxim of military science. It will achieve the moral effect sought only as an incident of action which aims directly at a military effect. Its aim will be military overthrow. The moral overthrow will be a by-product of that.

AIR POWER IN THE NEXT WAR

It will not delude itself into the belief that it is possible to bomb virile nations into defeatism while their military strength is still unbroken.

It will remember that if there is now a short cut, a royal road to victory through the air, it leads, as of old, to the destruction of the enemy's organised fighting strength. That has to be broken—that and its bases of supply and founts of renewal. A great nation must be disarmed if it is to be driven to despair. Air power can disarm it, at source.

Now, a wise belligerent will be alive to the truth of what has just been said : but what of the belligerent who is not wise ? What of him for whom, perhaps, the air arm which he has fashioned is proclaimed to be “ a frightful weapon,” a weapon with which “ to drive recklessly forward,” a fit instrument for the waging of totalitarian war ? Will air power be handled by him ruthlessly, relentlessly, murderously, without mercy or discrimination ?

Perhaps : one cannot tell. The bully will be beaten in the end, assuredly, for *Schrecklichkeit* will pay no better in the air than on and under the sea. But before he is beaten there will be immeasurable calamities to be endured.

They will be endured by both nations alike, for there can be no impassable barrier in the air and retaliation is as certain as the sunrise. That and another fact (sometimes forgotten)—the fact that the fighting airmen themselves are a body of

SUMMARY AND CONCLUSION

chivalrous men to whom the slaughter of women and children is abhorrent—are the grounds for hoping that no need for retaliation may arise.

Yet even if it never arises, if the prophecies of cataclysmic disaster never come true, if war is waged with so much decency as war permits, air power must add inevitably to the horrors and tragedies of a great international conflict. One can only pray that war may not come in any shape or form, that there may be peace in our generation. But praying for peace should not mean forgetting the need for defence. The way to hasten the coming of war is to stand defenceless in a world of armed men.

“One sword keeps another in its scabbard.” That is truer to-day than at any period in the past. It is true, too, with a new significance. Who knows but that the influence of air power may prove to be a pacific one? Just because those massed squadrons stand waiting for zero hour, zero hour may not arrive. The nations may fear to unleash the monsters which they have bred. That would be the greatest, the most welcome contribution that air power could make to “the next war”—that “the next war” never in fact comes.

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